Innovation: Its Relationships with a Knowledge Sharing Climate and Interdisciplinary Knowledge Integration in Cross-functional Project Teams

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Abstract

Interdisciplinary teams are employed with the expectation of bringing diverse expertise and generating innovations. The literature, however, shows that knowledge differences in the context deter team members from sharing and integrating knowledge. It is essential to embody a knowledge-sharing climate and interdisciplinary knowledge integration, both of which are critical to facilitating innovation. By drawing upon social capital theory, this study presents a knowledge sharing climate. This study also shows how interdisciplinary knowledge integration mediates between functional diversity and innovation and between a knowledge-sharing climate and innovation. Data collected from 202 individuals from interdisciplinary project teams were used to test the research model. Empirical results indicate that innovation is significantly affected by interdisciplinary knowledge integration and openness. Functional diversity and trusting relationships do not have direct impacts on innovation but are mediated by interdisciplinary knowledge integration. The findings have critical theoretical and practical implications which are discussed in the paper.

1. Introduction

It is imperative to establish the ecology of innovation which is vital to a firm’s survival and prosperity on a continual basis. With the rapid growth and interest in innovation, studies have found its enabling factors such as structure, culture, leadership, tasks, and environmental volatility at the individual, team, or organizational levels [18]. More fundamentally, the literature has offered a framework to explain innovation through the lens of a knowledge-based view of the firm [1, 25]. Innovation can be more likely to be generated by virtue of heterogeneity or knowledge diversity [8]. In fact, organizations employ interdisciplinary teams, which are believed to bring an array of expertise and thus novelty often [28]. Individuals on the interdisciplinary team, however, have different mental models shaped by their own disciplines and experiences, and they address problems with different patterns and heuristics [9]. Knowledge management (KM) initiatives can be ineffective as members are reluctant to sharing knowledge due to the different knowledge domains [20, 28]. Empirical research on functional diversity has also supported the argument with negative results [7, 18].

Innovation is increasingly promoted across team members who possess different specialized knowledge. On the other hand, it is a notable challenge on cross-functional teams to overcome cognitive boundaries and transform the team into an integrative collaboration. Certainly, the interdisciplinary context erect barriers to generating a suitable knowledge sharing climate and deter the team members from integrating knowledge differences, eventually affecting the capacity of innovation. What makes team members more likely to innovate in the face of the interdisciplinary context? What is an overarching set of knowledge-sharing climate factors affecting innovation in the interdisciplinary context? How can the knowledge-sharing climate factors be organized into interdisciplinary knowledge integration explaining innovation? This study seeks to answer these enduring questions in the literature. Accordingly, a core contribution of this study is to unpack the dynamic nature of a knowledge sharing climate and interdisciplinary knowledge integration with their relationships to innovation.

New ideas are generally proposed by individuals and usually implemented in the setting of teams and thus many studies have attempted to find team-level variables facilitating innovations [17, 18]. Taking a step further, the literature has called for research putting more emphasis on the performance of individual team members [36]. Individuals are often a component of other levels of analysis, not to mention teamwork [4]. This study pursues individuals’ perception of the innovation process in the interdisciplinary teamwork context.
2. Literature review and research framework

Research has found that innovation is significantly affected by various aspects of knowledge: knowledge diversity, depth, and linkages [8], knowledge quality [41], customer knowledge [15], knowledge spillover [5], knowledge reuse [31], or knowledge creation [33]. Innovation is substantially different from regular processes or routine problem solutions. It involves “a social-political process” with the awareness that risky attempts can result in a failure and get blamed [3]. It also demands the synthesis of a wide range of knowledge through cross-fertilization from a variety of functions [8]. Although the adoption and use of heterogeneous knowledge is essential [8], the influence of knowledge differences is noteworthy. While cross-functional boundaries leads to increased adaptation, speedy time-to-market, and increased firm performance, they also increase cost, conflict, and job stress, and the decline of strategic consensus and team social integration [7, 9]. Certainly, a diverse set of knowledge from diversity should be integrated, transformed, and disseminated to enable convergence toward common understanding and collaboration. This study argues that capabilities of a knowledge sharing climate and interdisciplinary knowledge integration play a significant role in increasing collaboration in the interdisciplinary environment.

2.1. Interdisciplinary knowledge integration and innovation

Because knowledge is unequally distributed among individuals [10], studies have emphasized its integration: expertise coordination [13], expertise integration [38] or knowledge integration [34, 37]. This study takes a step further to explore interdisciplinary knowledge integration, which is particularly important in cross-functional context to facilitate innovation. Members from functional diversity have different perspectives and insights regarding approaches, processes, and tasks [37]. The interdisciplinary context requires individuals to complement their knowledge through mutual interactions and collaborative influences.

Expertise integration is depicted as “the coordinated application of individually held specialist expertise in the accomplishment of tasks at the project level” (p. 17) [38]. Knowledge integration is described as the “synthesis of individual team members’ information and expertise through social interactions” (p. 315) [34]. Building on the literature, interdisciplinary knowledge integration is the synthesis of team members’ interdisciplinary expertise through social interactions by appreciating, making sense of, and advancing the distributed knowledge. It is a process of appreciating, articulating, and advancing knowledge through social interactions among members. It is not a mechanical process of simply collecting and combining disparate knowledge. Rather, it is an organic interaction that can communicate and employ relevant, specialized knowledge for innovation.

Team members on an interdisciplinary team show a lack of common ground and a shared language, and the differences significantly limit the capability to exchange and use their knowledge. In other words, they may not understand some aspects of nuances of distinct knowledge and skills due to specialty from a variety of functions. In a teamwork environment, research has found that knowledge integration reduces software defects [39], enhances product innovation [27], and escalates decision quality [34]. Expertise coordination fosters team performance [13], and expertise integration facilitates team creativity [38]. As seen in the literature, it is critical to effectively use and collaboratively exchange knowledge from different disciplines by increasing mutual interdependencies. Team performance is not a just function of having the right expertise, but a result of coordinating it [13]. Multi-disciplinary members need to surface and reconcile various perspectives from different disciplines for the successful completion of a task. Innovation is the results of collaboration in which members with diverse disciplines appreciate, utilize, and advance their ideas through the process of interdisciplinary knowledge integration. As such, innovation may be more effectively promoted with interdisciplinary knowledge integration.

H1: Interdisciplinary knowledge integration in interdisciplinary team members is positively related to innovation.

2.2. Mediating role of interdisciplinary knowledge integration between functional diversity and innovation

Cross-functional teams are frequently used with the anticipation of bringing necessary expertise, infusing different viewpoints, and responding to new business opportunities/threats. Functional diversity implies specialized disciplines across team members which collaboratively interact to bring desired outcomes. The literature, however, has shown mixed results with positive and negative implications [7]. Accordingly, Hülsheger et al. [18] raise a research question: “Is diversity a proximal or a more distal predictor of
innovation?” The question is worth seeking answers, and this study strives to make a contribution to this research stream.

Functional diversity is important because it brings sources of innovation, and team members can spark new ideas with the interactions with other disciplines [18]. However, they can also find themselves in disagreements on why, what, how they are doing without integration processes. Knowledge-intensive workers do not have mechanic patterns to generate organic solutions, but weigh feasible alternatives and reach hybrid combinations [30, 41]. Hülsheger et al. [18] argue that relevant diversity will have a strong impact on innovation when members have “high cohesion and the existence of shared mental models.” They also suggest that innovation can be stirred up “by sensitizing team members to their different kinds of knowledge, skills, and abilities, and by helping them to value and use their different viewpoints and engage in elaborating and integration of opposing viewpoints” (p. 1138) [18]. That is, interdisciplinary knowledge integration is an essential process that promotes mutual collaboration and transform knowledge. It helps team members to compare and contrast various perspectives from different disciplines and eventually integrate them for the uniformity of cognitive mental models. It allows team members to be more appreciative and aware of their interdependent nature of their functionally diverse knowledge. As team members articulate, critique, and extend interdisciplinary knowledge through integration, innovation will be more likely to take place.

H2: The effect of functional diversity on innovation is fully mediated by interdisciplinary knowledge integration.

2.3. Knowledge sharing climate and innovation

In “a nontreating atmosphere and a positive affective tone,” team members are not hindered by job- or relationship-related conflicts and rather present and develop their new ideas without hesitation [18]. A knowledge sharing climate among team members is certainly essential to innovation because it reduces social pressure, creates a friendly environment to think out of the box, and develops autonomous freedom. A supportive, cooperative climate enables individuals to socialize and solidify their ideas and leads to innovation [18, 38]. Instead, members feel a loss of power as they share what they know in a prevailing competitive, secretive climate [22].

Social capital theory explains the dynamics of a knowledge sharing climate in the interdisciplinary context. Social capital is described as “sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit” (p. 243) [32]. The theory illustrates that social action needs expectations, cooperation, and reciprocal obligations in the social network and relationships [36]. The theory has been received wide attention, but there is a lack of consensus on the composition of social capital [34]. Nahapiet and Ghosal [32] present three dimensions of social capital (i.e., structural capital, cognitive capital, and relational capital), and these three dimensions are well received in the literature. The structural dimension reflects ties and connections among social actors and illustrates the general patterns of interactions with other individuals [32, 34, 40]. The relational dimension describes “the extent to which individuals have trusting relationships with other individuals within his or her network” (p. 347) [36]. The cognitive dimension depicts shared meanings, understandings and representations in which individuals have with one another. Sarker et al. [36] employ trusting relationships for the relational dimension and communicative relationships for the structural dimension. Learning knowledge, skills, and specialized discourses is crucial in the cognitive capital [40]. Drawing upon the theory and the literature, this paper uses trusting relationships for relational capital, openness for structural capital, and a learning goal orientation for cognitive capital for the context of this study.

2.3.1. Trust and interdisciplinary knowledge integration

Trust plays a significant role in processing interdependent relationships, understanding social circumstances, and reducing social complexity [16, 21]. As a large number of studies on trust have been conducted, a variety of conceptualizations have been given. In the KM context, Kankanhalli et al. [20] describe trust as “the good intent, competence, and reliability of employees with respect to contributing and reusing knowledge through electronic knowledge repositories.” (p. 117) Knowledge is of limited value unless it is transformed to others and adapted to task-specific context. It is particularly difficult to manage distinct expertise on a functionally diverse team. “Cognitive or task-based conflict” can occur when there are different opinions about a task [9]. Trust is an important factor in situations where there is a relationship of interdependencies [21]. It is a significant antecedent of participation, providing an environment for effective knowledge exchanges and active cooperation [16, 20]. As members trust one another, they do not have to spend considerable time to
show the relevance of knowledge [19]. Research shows that “relational capital directly impacted knowledge integration equally, regardless of the communication media by the team” (p. 314) [34]. Trust enables team members to value knowledge possessed or acquired by others and put their effort to appreciate and leverage it. Trust facilitates team members to have a mutual intent that understands differences, relies on each other, and integrates a diverse set of knowledge. As such, a high level of trusting relationships will have a high level of interdisciplinary knowledge integration which in turn has an impact on innovation.

H3a: Trusting relationships in interdisciplinary team members are positively related to innovation.

H3b: The effect of trusting relationships on innovation is fully mediated by interdisciplinary knowledge integration.

2.3.2. Openness and innovation

Members of a project team may be unwilling to share their knowledge or resources if they have an atmosphere of secrecy and competition [18]. In a psychologically nonthreatening atmosphere, knowledge interactions among team members can effectively take place. Even though ideas may be different from the status quo, it is vital for members to speak up [12]. Openness is defined as the extent to which team members are encouraged to express their ideas, even though the ideas may be contrary to existing knowledge. It is related to a warm, supportive environment.

A high level of openness indicates that members of an interdisciplinary project team do not feel embarrassed, silly, or penalized with any representation of ideas. The climate of openness on a team provides members latitude to consider situations in a different perspective, and members are comfortable to ask any question and examine different views. Research shows that members’ comments and suggestions, which are intended to improve functioning, are critical to performance [12]. More effective group functioning can be encouraged by open discussions [9]. To enhance the capability of innovation, team members need to exchange divergent viewpoints and evaluate them in the open environment [18]. That is, the climate of openness will enable team members to express their perspectives actively and explore different knowledge frequently. Openness with free-flowing knowledge, risk-taking, and sometimes failures leads to increased interactions among team members. Openness among team members will enhance an understanding of their complementary contributions, valuable knowledge, and work styles, which escalates the level of innovation on the team. It encourages team members to voice their opinions or give feedback, both of which are critical when producing innovation.

H4: Openness in interdisciplinary team members is positively related to innovation.

2.3.3. Learning goal orientation and innovation

Individuals on a cross-functional team need to share their past experiences, exchange newly developed knowledge, and discuss their challenges. To facilitate this process, the cognitive capital is imperative. The cognitive dimension of social capital refers “shared representations, interpretations, systems, and language” [36]. It can be developed as members interact by sharing practices and learning knowledge, skills, and specialized discourse [40]. Learning orientations of members to examine knowledge they acquire and generate and to translate and transform knowledge from others will enhance the flow of knowledge of an interdisciplinary project team. The learning goal orientation explains how individuals are motivated while “approaching, interpreting, and responding to achievement situations” [17]. It plays a critical role in seeking to educate their understanding and development to other members and to use and reuse knowledge possessed and generated by others on the team. Team members with a high level of a learning orientation may “choose to engage in adaptive behaviors patterns such as selecting challenging tasks, setting difficult goals, and persisting when obstacles are encountered” (p. 626) [17].

Innovation will not be attained unless team members of the interdisciplinary project team have a propensity to provide their content and receive feedback, and to examine knowledge from others and supply comments to them. In a climate of learning goal orientations, members’ exploration and experiment are most likely to take place particularly in a cross-functional team. Innovation may be escalated when team members better understand the nature of interdependent work and strive to educate and encourage one another. When individuals find their teams cognitively pleasurable, it influences their knowledge acquisition effort to acquire new knowledge and further advance it with their existing knowledge. Because learning goal orientations help to identity, assimilate, and mobilize knowledge, team members can process relevant knowledge and monitor new developments on a regular basis [8]. The design of team goals has an impact on interaction among members who may help one another [18].
H5: Learning goal orientations in interdisciplinary team members are positively related to innovation.

3. Research methods

The survey methodology was used to test the research model. Instruments for trusting relationships were adopted from Kankanhalli et al. [20]. Items for learning goal orientations were adapted from Hirst et al. [17]. Scales for openness were adopted from Ashford et al. [2]. Functional diversity was measured using items from Campion et al. [6]. Based on Robert et al. [34], interdisciplinary knowledge integration was measured according to the interdisciplinary project team context. The frequency or incidence of innovation initiation, adoption, and implementation was widely operationalized to measure innovation in the literature [14], and items for innovation were taken from the study. This study was concerned that team size and industry could impact on innovation. Larger teams may better undertake difficult tasks in uncertain situations. Some industries may be more competitive and innovative. Controlling for the variables may help see better impacts of a knowledge sharing climate and interdisciplinary knowledge integration on innovation.

A pilot study was administered before conducting a large-scale survey. The Society of Manufacturing Engineers (SME) provided a list from project leaders, project engineers, project specialists, development engineers, senior development, process development, and business development from the same industries as the one to be used in the large-scale study. 33 respondents were used.

After purifying items, this study conducted a large-scale survey. The Society of Manufacturing Engineers (SME) and the Society of Automotive Engineers (SAE) provided target respondents who were project leaders/managers, project engineers, project specialist, senior development, or product/business development. Respondents answered the questionnaire on a scale from 1 to 5, where 1 was “Strongly Disagree” and 5 was “Strongly Agree.” 202 individuals participated in this study. Respondents were CEO/president (5%), vice president/director (9%), senior engineer (3%), project leader (30%), team leader (25%), and engineer (16%). SIC codes were 34 (Fabricated Metal Products, 25%), 35 (Machinery, except Electrical, 14%), 36 (Electric and Electronic Equipment, 17%), 37 (Transportation Equipment, 25%), and 38 (Instruments and Related Products, 10%). Team members were: 2-5 (19%), 6-10 (39%), 11-15 (15%), 16-30 (13%), and 31 and over (9%). Average annual sales were: less than 10 million (13%), 10-49.9 million (13%), 50-99.9 million (12%), 100-499.9 million (12%), 500-1 billion (7%), and over 1 billion (37%). Respondents had 12 years of experience in their firm (median = 9.00, standard deviation = 9.79). In addition, respondents assured functional diversity in their projects. Response/non-response bias was tested by comparing earlier respondents to late respondents. The two different sets were compared on the SIC code and the number of employees using a Chi-square test. No significant differences between the two groups were found in the SIC code and the number of employees.

3.1. Measurement model

Confirmatory factor analysis was tested to determine convergent and discriminant validity for measures, using SmartPLS 2.0. Convergent validity was reviewed by item loadings, composite reliabilities, and average variance extracted (AVE). All item loadings from the analysis exceed 0.700, shown in Table 1. Internal consistency was examined with composite reliabilities, and results indicated that all constructs exceeded the 0.7 guidelines, shown in Table 2. All the variables of AVE were greater than 0.5 guidelines. Discriminant validity was tested by comparing the square root of AVE to all respective correlations. Results illustrated that the data did not have any problem for discriminant validity.

There may be a possibility of common method biases along with self-reported data. This study followed the PLS model which explored each indicator’s variance. The average variances explained by the substantive indicator and the method are 0.767 and 0.003 respectively. Because the magnitude of the method variance is small, the common method bias is not a significant concern.

Table 1. Item loadings and cross loadings of confirmatory factor analysis

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Table 2. Descriptive statistics, correlations, and average variance extracted

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CR: Composite Reliability
1: Interdisciplinary knowledge integration; 2: Functional Diversity; 3: Innovation; 4: Openness; 5: Learning goal orientation; 6: Trusting relationships

3.2. Mediation analysis

Because interdisciplinary knowledge integration was modeled as a mediating variable, this study tested the mediated impacts according to the literature [23, 29]. A pseudo-F statistic was calculated by using R² from the full and excluded models. This study first examined the R² value by considering the additional functional diversity-innovation, trusting relationships-innovation, openness-interdisciplinary knowledge integration, and learning goal orientation-interdisciplinary knowledge integration into the original model, and found R² values which were 0.017, 0.004, 0.047, and 0.054 respectively. Then pseudo-F were 3.340 (p > 0.05), 0.704 (p > 0.05), 9.074 (p < 0.01), and 10.352 (p < 0.01). The results indicate that adding additional networks between openness and interdisciplinary knowledge integration and between learning goal orientations and interdisciplinary knowledge integration increased the explanatory power, whereas adding networks including functional diversity-innovation and trusting relationships-innovation did not. In other words, interdisciplinary knowledge integration mediates the relationship between functional diversity and innovation and the relationship between trusting relationships and innovation. In addition, there are direct effects of openness and learning goal orientations on innovation.

3.3. Structural model

The research framework was examined by testing their path coefficients and percentage of variance explained, shown in Figure 1. Interdisciplinary knowledge integration had a positive, significant influence on innovation (β = 0.359, p < 0.01), supporting H1. Functional diversity positively affected interdisciplinary knowledge integration (β = 0.212, p < 0.01), while its effect on innovation lacked statistical significance (β = 0.057). According to this mediation tests above and the structural model, H2 was supported. Trusting relationships had a positive, significant influence on interdisciplinary knowledge integration (β = 0.363, p < 0.01), but showed a lack of statistical significance on innovation (β = -0.008). Based on the tests of the structural model and mediation, H3a and H3b were supported. Openness had a positive, significant impact on innovation (β = 0.188, p < 0.01), but it was not significant on interdisciplinary knowledge integration (β = 0.049). It supported H4. Learning goal orientations weakly impacted innovation (β = 0.204, p < 0.10) with no statistical influence on interdisciplinary knowledge integration (β = 0.008). Accordingly, there were a weak relationship between learning goal orientations and innovation. For control variables, industry had an impact on innovation and team size did not have a relationship with innovation. The research model explains 23.9% of the variance in interdisciplinary knowledge integration and 26.4% of the variance in innovation.

Figure 1. Structural model results of the research framework

4. Discussion

This study recognizes important attributes of intellectual capital and their integration to strengthen innovative capability and explores how they can be embedded on interdisciplinary project teams. This study makes novel contributions by developing and testing the research framework that reveals essential elements of innovative processes: a knowledge sharing
climate and interdisciplinary knowledge integration. In particular, it examines differing impacts of a knowledge sharing climate on innovation and the mediating role of interdisciplinary knowledge integration on innovation.

4.1. Implications for research

Information technology has been emphasized for the success of knowledge interactions but does not guarantee knowledge exchanges among organizational members [40]. Social capital is more significant to ensure knowledge exchange, and this study finds important social aspects that explain a knowledge sharing climate in the interdisciplinary project team context. It is crucial to address differences between climate and culture. While they often measure the same phenomenon, there are also distinct differences. An organization’s climate generally focuses on perceptions on a particular thing such as a safety climate or a knowledge sharing climate, and it is regarded to be more visible and adaptive. Although organizational culture has been widely examined [24], not much attention has been given to a knowledge sharing climate. This study develops a knowledge sharing climate through the lens of social capital theory in the interdisciplinary context for innovation. Social and psychological theories to reduce team members’ conflicts and facilitate innovation have been employed [18, 20, 34]. Building on the literature, this study presents three aspects of a knowledge sharing climate (i.e. trusting relationships, openness, and a learning goal orientation). Different views, idiosyncratic ideas, and various opinions are inevitable to innovation processes [18]. It is imperative to create a nontaxing atmosphere that stimulates innovation-related cognitive processes among members. The results of this study will provide insights about a knowledge sharing climate in the interdisciplinary context.

It is noteworthy to notice that the structural dimension of social capital, manifested by openness in this study, has the strongest impact on innovation. This dimension describes patterns of interactions with other members and the link that helps acceptance and use of knowledge [32, 34, 40]. If divergent, different views are suppressed without being examined, or self-censored before they are even expressed, valuable knowledge is silenced. Openness stimulates interpersonal interactions by exchanging ideas, discussing different aspects, and engaging in critical discussions. It also facilitates regular appraisals of ideas and promotes back-up plans and activities. Because an organization’s competitiveness depends on the effective management of intellectual resources, a cross-functional team needs to provide an open climate where members access and exchange knowledge and it will induce innovation.

Team members with multiple disciplines may not understand some aspects of specialized knowledge, or they may have insufficient backgrounds to render their interactions meaningful. Consequently, understanding, combining, and integrating interdisciplinary knowledge are an essential process for value creation. Team members need to adopt perspectives of other disciplines on problems and solutions to reach the best alternatives. When knowledge is distributed among team members with different functions, interdisciplinary knowledge integration is a useful way of innovation. Particularly, this study presents a mediating role of interdisciplinary knowledge integration between functional diversity and innovation and between trusting relationships and innovation.

Exposure to other functional disciplines is more likely to spark new perspectives and adopt new ways of doing. Diverse understanding, however, should be explored by interdisciplinary knowledge integration. The results of this study indicate that functional diversity has a statistically insignificant impact on innovation. Rather, the influence is mediated by interdisciplinary knowledge integration. As a matter of fact, research shows that input factors such as a team’s structure and composition have a weak impact on innovation, while process variables are a strong influence on innovation [18]. Functional diversity brings diverse types of expertise, which need to be communicated and incorporated. The positive effect of team members’ diversity on innovation is attributable to members’ effort for integration. Although it is believed that functionally diverse teams bring a number of benefits, literature on functional diversity shows a mixed picture – both positive and negative. This study reconciles the different impact by introducing the mediating role of interdisciplinary knowledge integration to the literature.

There are studies on trust and knowledge interactions in the literature. Trust is a significant facilitator of tacit knowledge, while it impacts explicit knowledge to a lesser degree [35]. Competence-based trust is particularly important for the receipt of tacit knowledge [26]. This research builds on the literature and addresses that trusting relationships are critical to knowledge integration in the interdisciplinary context. Individuals are reluctant to process knowledge offered by someone they do not know well, and relationships are critical to knowledge exchanges [11]. Trust is a critical variable to foster knowledge integration. However, it does not have a direct impact on innovation. Rather, it helps relationship building on team members from different disciplines and
understands their differences and work styles. As trust on a team runs high, the efficiency of work processes will be improved by developing cohesion, consensus, and collaboration. It will induce interdisciplinary knowledge integration which in turn impacts innovation.

4.2. Implications for practice

Interdisciplinary teams are less likely to have salient attributes or experiences in common, which significantly limit the ability and frequency of interactions. This study provides practical implications about how different views and understandings can be coordinated. The size of path coefficients provides insights about the relative importance to innovation. Interdisciplinary knowledge integration is the highest loading, and openness and learning goal orientations follow. It illustrates that the various set of knowledge should be integrated, communicated, and interacted in an open, error-friendly environment. It also indicates that interdisciplinary knowledge integration is more important than a knowledge sharing climate in light of promoting innovation. As team members actively interact specialized knowledge, they may complement their core knowledge and make unique understanding as a whole. Innovation does not occur when organizations simply make knowledge available to team members. Team members need to actively share different expertise and create their own perspectives to foster innovation.

This study also shows the impact of trusting relationships and functional diversity on innovation. Trust is a central aspect in many types of transactions because of social needs for identifying what, when, why, and how others behave [16]. This study shows that trust is indeed an essential attribute that embodies interdisciplinary knowledge integration which in turn affects innovation. When team members are assembled to set out their project, it would take time to understand their work styles and organize their specialized knowledge in pursuit of the successful completion of the task. There is a proverb that “You can lead a horse to water, but you can’t make it drink.” Teams can bring experts from different disciplines for a project, but the different knowledge from diverse functions should be shared and coordinated through interdisciplinary knowledge integration, which in turn results in innovation. The results of this study provide guidance for managers who seek to design effective interdisciplinary team and produce innovation.

4.3. Limitations and suggestions for future research

While the findings of this study have significant implications, it is also important to note limitations of this study that create opportunities for future research. This scope of this study was restricted to project teams in the interdisciplinary context. Accordingly, the results of this study should be interpreted in this environment. Certainly, this study does not completely embody all the possibilities, and generalizing to other contexts requires additional research. This study is interested in individual perceptions on innovation. Future studies may explore aggregated individual responses on team-level innovations. This paper operationalizes trusting relationships in the cognitive-based aspect to test the research framework. Future studies would attempt to have a different view of trust and examine the model in another context. The data collected are perceptual, and it is could be problematic because respondents may not be willing to admit their poor performance. The generalization of these results is also limited and additional research with multiple responses may need to be conducted to more fully understand the empirical generalizability of the research model. This study tested the research model at the project team level. Future studies can collect data at the organizational level to see the impact of a knowledge sharing climate and interdisciplinary knowledge integration on innovation.

5. Conclusions

This study began exploring impacts of a knowledge sharing climate and interdisciplinary knowledge integration on innovation. Organizations want members to actively disseminate and apply knowledge because they are significantly enhancing their innovative capacity. Research, however, reveals that organizational members are reluctant to share their knowledge because they feel a loss of power with sharing. It is also a challenge to integrate knowledge in an interdisciplinary context. This research explores how management establishes a knowledge sharing climate where team members actively share and integrate their distinctive knowledge and, ultimately, produce innovation. The findings of this study will shed light on understanding of employing social capital and producing innovation.

6. References


