

Effect of Organizational Factors on University-Industry Collaboration: A Conceptual Model

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Abstract

This paper presents the development of a conceptual model for effect of organizational factors on success of university-industry collaboration. This model aims at exploring the effect of five organizational factors, including communication, trust, conflict, leadership, and commitment on success of collaboration process between university and industry in Malaysia. The paper commences by reviewing the literature on process models that has been offered for process of collaboration. Next, a comprehensive literature review is presented for five organizational factors and effect of these factors on success of the collaboration. Finally, a development conceptual model for effect of organizational factors on success of university-industry collaboration is offered. This conceptual model can be used as a basis for future research on success of university-industry collaboration in Malaysia.

Keywords: collaboration, partnership, university, industry, organizational factors

1. Introduction

The academy-industry cooperation has been made a trend in recent years. Both collaborated parties will gain benefits with the process of cooperation (Jorge, Virgilio, & Kirsimarja, 2005; Miotti & Sachwald, 2003; Bayona Sáez, Garcia Marco, & Huerta Arribas, 2002). More of venture for new opportunities is required to be done by the industry and the academy alongside with creating any possible cooperation in the recent competitive landscape perspective which involved the demands of customer and the constant involvements of new players which also distinguished by resource pressure, globalization, shorter product life-cycles as well as rapid technological change (Hagen, 2002; Dooley & Kirk, 2007; Santoro & Gopalakrishnan, 2001). In order to stay competitive, investment should be made by the organizations on inter-organizational initiatives which characterized as “powerful because they enable organizations to share risks, build on jointly shared capabilities, and create synergies for better competitiveness” (Santoro & Gopalakrishnan, 2001). Over time, scholars have offered many definitions for inter-organizational relations, such as cooperation and collaboration; however, they did not much attempt to reference other usages of the terms. As a result, despite the emphasis on collaboration for the past couple of decades (Elliot, 2001), still there is a lack of consensus as to its definition (Jenni & Mauriel, 2004). Because it is used to describe so many kinds of relationships and activities, the term is not well understood. It suffers thus not from a lack of meaning, but from too much meaning! Van de Ven (1976) characterized the inter-organizational relationship (IOR) as a social action system that displays the three basic organized collective behavior elements: (a) the behavior of members is expected to achieve the collective and self-interest goals; (b) the presence of interdependent processes in the course of division of tasks and functions among members; as well as (c) the unit which is recently organized owns a unique identity that distinct it from the others. In this research, the so-called inter-organizational relationships are called as cooperation, collaboration and partnership. According to Gray (1989) collaboration is “a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible”. Regarding definition of inter-organizational relationship and collaboration, it's clear that we look at collaboration as a process. The literature on collaboration documents indicates successful collaborations require significant time and effort. These efforts occur in stages of partnership process to development that requires a planned and phased approach. In this article we will provide a review of partnership processes for the public and private sector.

In the past several years, justifications were attempted to be made on the grounds of the industry and research organizations relationships by numbers of research papers (Chen, 1994; Ahn, 1995; Mansfield, 1995; Bayona, Garcia-Marco & Huerta, 2001; Cassier, 1999). In addition, several researchers (Mattessich et al., 2001; Mohr & Spekman, 1994; Dowling et al., 2004; Steinhart & Alsup, 2001) determine various success factors for inter-organizational relationships. In past studies, the center of attention has been on the single or series of factors. While studies considering those factors add great value to the process of university-industry collaboration, it seems that considering organizational aspects, which affect these interactions, field could be beneficial and advantageous. This study intended to provide a theoretical basis to develop a conceptual model which shows the effect of these factors on university-industry collaboration. With this aim, we have reviewed the literature and empirical studies on this subject; select those organizational factors which literature put the highest level of significance and relevance towards an effective relationship between university and industry. Although organizational factors are more relevant in the development stages of the partnership process, the role of these factors in the early stages of a partnership is important. Indeed, part of the behavior of the partner is determined by organizational features and that the behavior of other partners might as well influenced by them. The commitment, communication, trust, conflict and leadership are referred to as organizational factors in this research (Gray, 1985; Escribá & Menguzzato, 1999; Child & Faulkner, 1998; Das & Teng, 1998; Gulati, 1998; Montoro, 1999; Alexander, Comfort, Weine & Bogue, 2001). The recognition that organizational factors are central to successful collaboration has triggered to research on the factors that contribute to developing and maintaining effective collaboration between university and industry.

All in all, the aim of this study is to develop a conceptual model which shows effect of organizational factors on university-industry collaboration in Malaysia. In compare developed countries, university-industry collaboration is a relatively new phenomenon in Malaysia with the efforts of the government in promoting the R&D and innovation culture. The Secretary General of Ministry of Higher Education (MoHE), Malaysia emphasizes the importance of partnerships between industry sector and academia. On the other hand a national survey (MOSTI, 2006) results show that the industries in Malaysia is still very much relied on in-house R&D activities rather than collaborating with universities. So the need develop university-industry collaboration activities in Malaysia is too important. Different organizational, cultural, technical, and environmental factors affect the process of collaboration. In this way, this study tries to offer a conceptual model which shows the effect of organizational factors on success of university-industry collaboration in Malaysia. The results of this study can be useful for both industry professionals and academia to get a better understanding of organizational factors which affect the process of collaboration. To meet the goal of our study, we started with a general review on inter-organizational partnership process models. Afterwards, we will discuss about organizational factors which have effect on process of partnership between firms and academics. All of these will help us to propose a conceptual model.

2. University-Industry Partnership Process

Because collaborations are constantly changing over time, discussion of collaboration requires attention to the phases and group process stages. Several developmental models for collaboration are presented in the inter-organizational literature. Literature claimed that an approach of planned and phased university-industry collaboration is needed in several stages to development. Partnership processes review for the public and private sector is included in this section.

Childs and Faulkner (1998), discuss the stages for managing alliances in the business field. They determine four stages of the partnership. The first stage is related to establishing nature of cooperation, which includes motive for establishing partnership and developing trust. The second stage involves the implementation of cooperation which incorporates the selecting of partners; the determination of the partnership form; negotiation; power and trust; the contribution of partners' evaluation. The third stage is associated with the managing cooperation which has need of the identification of the partner objectives as well as the distribution of suitable resources and management. Besides, the variation of the partners and work recognition are significant issues in this phase, so as to make better the fit between the organizations. The relationship maturation is delineated in the fourth phase. In this stage, each organization learns from one another which bring to the partnership expansion. However, this might as well not be working out thus bring to the efforts separation.

Three stages to explain the nature of collaboration are occupied in a process model developed by Gray (1989). The problem setting the stage or the first stage concerns the problem definition, the collaboration consist as a method of directing the problem, the recognition of suitable stakeholders, the level of individual stakeholders contribution establishment, the establishment of the person who will gather the stakeholders (convener), and the recognition of resources which essential to aid the partnership. The second stage is the direction setting which is the stage where partners attempt to set up ground rules of openness and mutual respect, the arrangement of the

agenda that is needed to be carried out, the sorting out of the collaborative process, the attainment of information from one another; the venturing of the obtainable options, as well as the reach to agreement. In the third phase, the constituents' agreement within each stakeholder organization is acquired to execute the partnership, gaining the external support, setting up the necessary structures as well as any essential changes, monitoring activities, and obtaining compliance.

A five stage development model is depicted in one of the report done by Joseph Rowntree Foundation (1997). The coming together issues are incorporated into the first stage. The model claims that the needs and demands which were identified to prevail over the differences and building trust as well as building capacity are the reasons which bring the partners together. The second stage is connected to the dialogue process, the common ground establishment, a vision agreement as well as the recognition of the task and actions needed. The Third stage involves the establishment of a formal structure, setting targets as well as the management team. The action plan delivery, the maintaining of partner participation, the evaluation of the partnership, and the refining of the action plan are required by the fourth stage. The final stage or the fifth stage proposes the planning of any possible exit strategy.

3. Organizational Factors

3.1 Communication

A vacuum will not allow collaboration to happen and therefore, communication plays a significant role (Sclater, Grierson, Ion, & MacGregor, 2001). Based on this, the communication can be described as an exchange of information process, concepts as well as ideas between individuals who belongs to different organizations. One of the factors which recognized to be the most successful in most time as described in research papers is the open and frequent communication (Haire & Dodson-Pennington, 2002; Chisholm, 1996; Gulati, 1998; Mattessich & Monsey, 1992; Child & Faulkner, 1998; Davenport, Grimes, & Davies, 1999). The development of a suitable communication system which brings to a regular exchange of information between partners is essential to ensure the agreement success (Davenport et al., 1999; Child & Faulkner, 1998; Gulati, 1998). Open and frequent communication allows groups to function through the development of both formal and informal communication links, which keep members informed and involved (Haire & Dodson-Pennington, 2002; Sink & Jackson, 2002; Mattessich & Monsey, 1992). Frequent A system of open communication will help identify the responsibilities each member has for communication with each other and with those outside of the group and assure that everyone is informed and no one is left out (Mattessich & Monsey, 1992). Effective partners share information related to goals and technical data in order to resolve conflicts or to navigate changing situations. This communication serves to foster mutual trust between the parties (Kanter, 2000).

These evidences prove that, communication which turns up as the primary element of collaboration is not by chance. The collaboration success can be influenced by the open and frequent communication which is assumed to be a vital factor. This is equally essential to the establishing of informal relationships and communication links (Mattessich et al., 2001). With regard of these assumptions, we can promote a hypothesis which found a positive relationship between the effective collaboration and the communication. The hypothesis is as follows;

Hypothesis 1: Better communication has a positive effect on the success of university-industry collaboration.

3.2 Commitment

As second organizational factor, commitment of the partners has significant effect on university-industry collaboration (Santoro & Gopalakrishnan, 2000; Plewa & Quester, 2006). Moorman, Zaltman, & Deshpande (1992) defined commitment as "An enduring desire to maintain a valued relationship". In a research by Dowling et al. (2004) which attempted to conceptualize a successful partnership model, they indicated implementation of such model is depended on the level of engagement and commitment of partners. This comprises the eagerness shown by both parties as proved by the partners' beliefs and behaviors. Mohr and Spekman (1994) supposed that the partners' commitment in making an effort on behalf of the relationship is accounted as the essential attributes of partnership which is considered as successful. A high level of commitment brings to a situation where both parties are able to attain the objectives of both individual and joint. The authors assert that joint participation enables both parties to understand the strategic choices facing much better.

The literature on the connection between firms and research organizations involves with commitment from various points of view. Some aspects are therefore can be notable to be reflected on in its analysis: the number of resources provided by the partners, the participation of the personnel who is directly involves in the relationship as well as support from top managers. A partnership literature review by Mattessich and Monsey (1992), supports the assertion that effective implementation begins with the allocation of sufficient resources such as

funds, staff, materials, and time. Many authors believe and have highlighted that the shortage of such funding and resources will contribute to an obstruction towards the engagement (Coburn, 1998; Crosswaite & Curtice 1994; Davis & Howden-Chapman, 1996; Huberman, 1983; Johnson, 1980). Studies indicate that the degree of participation and involvement of the partners (Gray, 1985; Gee, 1993; Burnham, 1997) and of the senior executives (Geisler, Furino & Kiresuk, 1991; Bonaccorsi & Piccaluga, 1994; Ghoshal, Arnzen, & Brownfield, 1992; Davenport et al., 1999; Gee, 1993; Mora-Valentin, Montoro-Sanchez, & Guerras-Martin, 2004) have significant effect on cooperative relationship effectiveness. All of these evidences will sight us to hypothesize the importance role of commitment on success and effectiveness of university-industry collaboration. So the hypothesis is as below:

Hypothesis 2: Higher level of commitment has a positive effect on the success of university-industry collaboration.

3.3 Trust

For the creation and development of inter-organizational relationships, trust among partners is very important (Cullen, Johnson, & Sakano, 2000; Hosmer, 1995; Mayer, Davis, & Schoorman, 1995; Taylor-Powell, Rossing & Geran, 1998; Bjerregaard, 2009; Philbin, 2008) and can be founded both in interpersonal or institutional relationships (Gulati, 1995; Zaheer, McEvily, & Perrone, 1998). Trust can be defined as “the expectation that one part will promise to fulfill its obligations, behave in a predictable way and negotiate and act fairly if the possibility of opportunistic action presents itself” (Zaheer et al., 1998). Universities are noted as knowledge suppliers which are trustworthy and dependable from the point of view of the industry (Mohnen & Hoareau, 2003).

Trust, which is important for the success of current collaboration, is even more important as a guarantee for the possibility of future collaboration. Indeed, the relationship between firms and cooperating research organizations require trust which is a crucial element of success which also fosters the development of the relationship (Klofsten & Jones-Evans, 1996; Davenport et al., 1999). In this sense, trust goes beyond being a form of behavior to being a significant factor providing psychological comfort to both sides (Plewa & Quester, 2007). In order to develop and maintain a relationship built on trust, Lewis (1999) defines conditions for trust and practices that earn trust. The assertion is that partnerships with these trust conditions and practices are successful. Conditions for the trust include: safeguards, mutual need, relationships, organization, joint leaders, continuity, and objectives.

Trust promotes confidence in the partners who participated in the exchange to believe that their participating partners will provide a fair treatment in a reliable way, and will aid to solve any troubles that may occur jointly. For that reason, trust may facilitate to lesser the apparent barriers to collaboration. When the level of trust in collaboration is low, partners are less probable to be impending about the information and knowledge needed to ensure the successfulness of the collaboration (Inkpen & Tsang, 2005). Hence, trust of high level between partners will promote rich social and information exchanges alongside hearten partners to exchange more of the valuable information and knowledge (Ring & Van de ven, 1992). All of these evidences will sight us to hypothesize the importance role of trust on success and effectiveness of university-industry collaboration. So the hypothesis is as below:

Hypothesis 3: Higher level of trust has a positive effect on the success of university-industry collaboration.

3.4 Level of Conflict

The interaction between partners has seen conflict as an aspect which is highlighted in previous discussion (Alter & Hage, 1993; Forrest, 1992; Kegler, Steckler, Mcleroy, & Malek, 1998; Mitchell & Shortell, 2000; Weiner & Alexander, 1998). Inter-organizational conflict can be defined as “the lack of harmony and agreement between the cooperating organizations” (Alter, 1990). Conflict unavoidably happens in any kind of inter-organizational relationship over a long period of time. Even though good alliances encounter conflict and problems (Isabella, 2002). Therefore, conflict is an element which must not eliminated, but something to be regulated (Van De Ven & Walker, 1984; Oliver, 1990). The effect of conflict resolution on the relationship can be productive or destructive (Deutsch, 1969; Assael, 1969). Conflict can promote synergy when partners’ contradicting point of view on issues sharpened the discussions and manage to kindle new ideas and approaches. However, if conflict is failed to be managed accordingly, the contradicting opinion might cause to tension in relationship among partners. Therefore, partners have to try to manage the level of conflict, even though the types of conflict resolution may however change eventually during the collaboration (Artz & Brush, 2000). The orientations of conflict resolution have been sorted as accommodating, avoiding, compromising, competing or collaborating (Hergert & Morris, 1988; Deutsch, 1969; Patterson & Handfield, 1996). Three of the most typical sources of

conflict are: vague roles and expectations, power imbalance, and when there is no progress made (Parkinson, 2006).

A negative relationship between the cooperative relationship and the level of conflict is renowned in majority of the literature which concentrates on the impact of conflict on cooperative relationships. Therefore, a high degree of conflict is unfavorable to succeed in both inter-organizational relationships (Alter, 1990; Merrill-Sands & Sheridan, 1996; Child & Faulkner, 1998; Gulati, 1998; Sanginga, 2006) as well as in firm-research organization relationships (Bonaccorsi & Piccaluga, 1994; Campbell, 1997; Davenport et al., 1999; Cyert & Goodman, 1997). All of these evidences will sight us to hypothesize the important role of conflict on success and effectiveness of university-industry collaboration. So the hypothesis is as below:

Hypothesis 4: low level of conflict has positive effect on the success of university-industry collaboration.

3.5 Leadership

According to literature review one of the most usual factors which mentioned by many researchers is leadership (Gomes, Hurmelinna, Amaral, & Blomqvist, 2005; Dooley & Kirk, 2007; Bayona et al., 2001). Effective collaboration requires effective leadership. Effective leaders should be skillful to conduct and manage collaborative relationships. Mattessich et al. (2001) describe skilled leadership as “the individual who provides leadership for the collaborative group has organizing and interpersonal skill, and carries out the role with fairness”. Because of these and some other characteristics, the collaborative partners approved respect or legitimacy upon the leader. Essex (2001) asserts that collaborative initiatives must be vigorously supported by top leadership, and that, administrators must be actively involved in collaborative endeavors and facilitate its success. The collaborative leadership therefore ensures group cohesion, group motivation, team effectiveness, and effective interpersonal communication among team members (Provan & Sebastian, 1998).

Successful implementation of the collaboration strategy is dependent on a leadership style that is characterized by stakeholders who share and participate fully in the tasks of leadership. In collaborative leadership approach, the leadership role is shared and participatory in the sense that it is rotational and appointed by participants themselves. Shared leadership mutually sets expectations, and fosters a climate that facilitates ongoing team interaction. This form of leadership facilitates cooperative work and inspires belief in the team’s capabilities (Cooper, 2003). In partnerships, the most successful leadership requires a person that identifies the demand for proper balance between power-sharing and control, between processes and results, between interpersonal trust and formalized procedures, and between continuity as well as the adjustment and (Alexander et al., 2001). So a well-organized, enthusiastic, committed leadership facilitates the success of collaborative activities. All of these evidences will sight us to hypothesize the important role of leadership on success and effectiveness of university-industry collaboration. So the hypothesis is as below:

Hypothesis 5: leadership has a positive effect on the success of university-industry collaboration.

4. Research Model

A schematic representation in Figure 1 depicts a model which shows the organizational factors that have effect on the process of collaboration between industry and university. Based on literature review on the process of collaboration, the process includes several stages. Several authors suggest their own model for process of collaboration. Despite all of those models agreed on a process based view to collaboration, there is no universal model for all kinds of collaboration activities. So in our supposed model instead of focus on stage of the collaboration process, we look on factors which affect process of collaboration. According to literature review, there are different kinds of factors, which cause to success or failure of the collaboration process. In this model we try to investigate the role of organizational factors on success of collaboration.

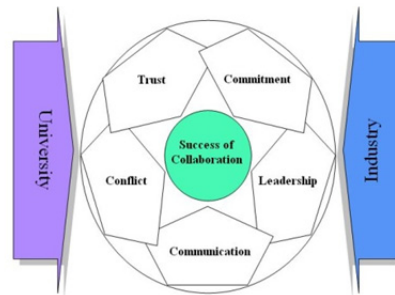


Figure 1. Conceptual model for effect of organizational factor on university-industry collaboration

In this research, we are referring to commitment, communication, trust, conflict and leadership as popular organizational factors in the process of collaboration. Although these factors have their independent roles on success of collaboration, there is interaction between each factor. It means that the strength or weakness of each organizational factors have direct and indirect effect on others. For example, increased trust in the relationship leads to higher commitment (Hadjikhani & Thilenius, 2009). The high level of trust between partners leads to more open communication, and information sharing, (Pender, 2006; Seppänen et al., 2007). Nordin (2006) asserts the insufficient communication can be a source of the conflict. These evidences and others from literature show mutual effect of these factors on each other.

5. Research Discussion

Universities and industries come together from two different cultures with different goals, needs, and capabilities. Arguably, it is difficult for both side to encompass all resources and capability within an organization (Hamel, Doz, & Prahalad, 1989). So the best strategy is collaboration. Despite such collaborative strategy as an attractive solution to deficiency, successful collaboration is not much easy as it seems. According to Gray (1989) collaboration is “a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible”. During this process, several factors affect it. According to literature review communication, commitment, trust, leadership and conflict are known as organizational factors which affect process of collaboration. There are two important matters related to effect of these factors on process of collaboration.

These factors don't have equal influence on different stages of collaboration process. For example trust is more important in initiating stages because trust must be present at the outset of collaboration and must also be cultivated during the collaboration process (Czajkowski, 2001). In addition, in early stage of collaboration conflict between partners is higher than last stages.

By looking at collaboration as a process, requirement for patience and taking the time to pursue a successful collaboration is essential. Time must be taken upfront to contribute to all of these success factors; for example, time was required for developing personal connections, building trust, controlling and managing conflicts, developing an open and fair communication, and clarifying roles and responsibilities.

According to what presented from literature about the role of organizational factors in the process of collaboration, during the establishment and development stages, it is recommended to design managerial and organizational mechanisms that facilitate a high degree of commitment, trust, good communication, reduced level of conflict, and effective leadership.

Frequent and open communication allows members to understand the intentions, concerns, and priorities of the other partners (Sewall, 1999). Communication, therefore, is an overarching success factor that supports inter-institutional collaboration success as well as reinforces and strengthens other success factors including identification of roles and responsibilities, and trust.

Trust, like communication, bridges across several success themes and supports the inherent relational quality of collaboration (Gray, 1989). The overarching theme of trust is embedded in all areas of collaboration and is critical to the collaborative relationship as well as the collaborative process.

A full commitment brings the situation in which both parties can attain individual and joint objectives. The cooperative relationship will become higher when the degree of participation and involvement of the partners and of the senior executives increase. Establish a strong desire within organization and at all levels of

organization to participate in collaborative activities among employees increase sense of commitment to the success of collaboration. In fact, all parties must have the belief that the collaboration is needed and that problems and issues can be and will be overcome.

Conflict unavoidably happens in any kind of inter-organizational relationship over a long period of time. So it is necessary to control conflict by using resolution strategies instead of trying to eliminate conflict between partners. Partners must work around their differences to reach a solution, while they consider all points of view and maintain respect for each other. In addition, it is suggested to focus on the sources of conflict and solve problems by using joint problem solving mechanisms.

Collaborative initiatives must be vigorously supported by top leadership, and that, administrators must be actively involved in collaborative endeavors and facilitate its success. In collaborative activities, characteristics, skill and style of leadership are significantly important. So a well-organized, enthusiastic, committed leadership facilitates the success of collaborative activities. In addition, all organizational factors that suggested in this model are under effect of leadership.

6. Conclusion

The aim of this study was to develop of a conceptual model for effect of organizational factors on success of university-industry collaboration. This study considers university-industry collaboration as a process that is affected by five organizational factors. A comprehensive literature review provided to show effect of these factors on the process of collaboration. Based on previous research, conceptual model which can be an initiative stage to investigate effect of organizational factors on success of collaboration in Malaysia, offered. The results of this study can extend knowledge of academia and industry professionals toward most important organizational factors in the process of collaboration.

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