


## RESEARCH ARTICLE

# Challenges in developing university-industry relationship: Quantitative evidence from higher education institutions in the UAE [version 1; peer review: 2 approved]

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**Abstract**

**Background and objective:** The lack of human and intellectual resources and capital has affected the survival of different industries and organizations in this globally competitive world. Universities have failed to provide necessary human resources to these organizations. The coordination between industries and universities is not optimal. Such challenges are being faced in the United Arab Emirates (UAE); therefore, there is a need to investigate the reasons behind these challenges to develop an ideal university-industry relationship in UAE. The present study aims to evaluate the missing links in the relationships between universities and industries of UAE.

**Methods:** A quantitative research design has been used to recruit 100 department heads and senior professors from 20 public and private universities in the UAE. Descriptive statistics, regression analysis and factor analysis have been used to analyze the data collected through SPSS v.20.




**Results:** The results have shown a significant and positive impact of intellectual property (IP) policies ( $p = 0.045$ ) and scientific knowledge ( $p = 0.023$ ) on knowledge transfer; IP policies ( $p = 0.067$ ), shared governance ( $p = 0.018$ ) and scientific knowledge ( $p = 0.017$ ) on trust; IP policies ( $p = 0.069$ ), shared governance ( $p = 0.034$ ) and scientific knowledge ( $p = 0.018$ ) on innovation performance.

**Conclusion:** The findings have suggested that the role of interorganizational governance mechanisms is important in university industry collaborations to increase trust, innovation, and shared governance.

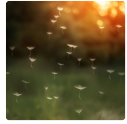
**Keywords**

University-Industry Relationship, Trust, Innovativeness, Shared Governance, Knowledge Transfer

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## Introduction

Organizations and industries cannot work in isolation to foster economic growth and create new ideas for innovation. There must be a holistic amalgamation of the industry, university and the government to forge ahead in the economic development of a country. The demand for strategic and deliberate relationship between universities and industries goes far beyond the traditional funding of research projects. Technological advances and wide-spread increase in global knowledge have increased the need for effective collaboration between university and industry. Communication and cultural division disrupt the relationship between the university and industry; and undercut the potential for a successful collaboration between them. Lack of communication can be resolved through student internships and through mutual and reciprocal visits of university and industry personnel (Alshehri *et al.*, 2016; Saad *et al.*, 2017).

Universities play a significant role as drivers of innovation and economic growth of a country. By creating an ever-expanding new knowledge base and new ideas, universities provide the best education to entrepreneurs, businessmen, and leaders of the future (Robertson & Olds, 2017). However, many universities in emerging economies and in the Middle East do not provide the quality education to students for top industries to recruit them in the future. Subsequently, not only does the students' prospect of getting employment in the best industries decrease, but the affect is felt in the economy and the development of a country. Despite the United Arab Emirates (UAE) efforts at boosting and enhancing cooperation between various sectors and consequently, announcing 2015 as the Year of Innovation and Excellence, there are substantial challenges that the country has been persistently struggling to overcome. Universities in the UAE are facing challenges in recruiting their best students in relevant industries. Universities need to forge new strategies that are modern, dynamic and fit for the decades ahead. Additionally, they also will have to build deeper relationships with relevant industries to promote the future of their students and subsequently be a part of the economic growth of the country.

Many industries and organizations have been facing serious challenges to survive in this globally competitive world. One

of the main reasons behind this ordeal is the lack of human and intellectual resources and capital. Universities have failed to provide the necessary human resources to these organizations, and coordination between the industries and universities is not optimal. All these factors affect the economy and growth of a country (Bstieler *et al.*, 2015). Presently, UAE has been facing such challenges and there is an urgent need to investigate the reasons behind these challenges to develop an ideal university-industry relationship in UAE. The main objective of this study is to evaluate the missing links in the relationships between universities and the organizations and industries of UAE, and propose measures to overcome the challenges, faced by universities in collaborating with the industries to overcome the relationship barriers.

## Theoretical framework

The collaborations between organization and universities are likely to develop, when there is a need of specialized knowledge that does not exist already. New and breakthrough products can be achieved by providing expert technological knowledge in academic institutions at early stages of innovation process (Bstieler *et al.*, 2015). It is believed that the organization working in the field of biotechnology are strongly interested in technological and scientific knowledge that is offered by the university (Veugeler & Cassiman, 2005). The initial collaboration conditions between university and industry are clarified through various governance mechanisms, which facilitate the agreement between them to perform a particular action.

Close work coordination and plan adjustments assist in the reduction of behavioral uncertainties. Skilled workers and strong leadership are required in effective governance that commits to the university-industry collaboration. This is necessary to foster the comfort level among the parties that are associated together for preventing potential breakdowns and unanticipated situations. Development of a trustworthy environment facilitate production of significant outcomes in the form of new products and technologies (Bstieler *et al.*, 2015) (Figure 1). Different ways are adopted by the representatives of different organizational culture to organize their work and solve problems. Any drawback in this system may lead to conflicts and unproductive friction, which affects the trust formation negatively.

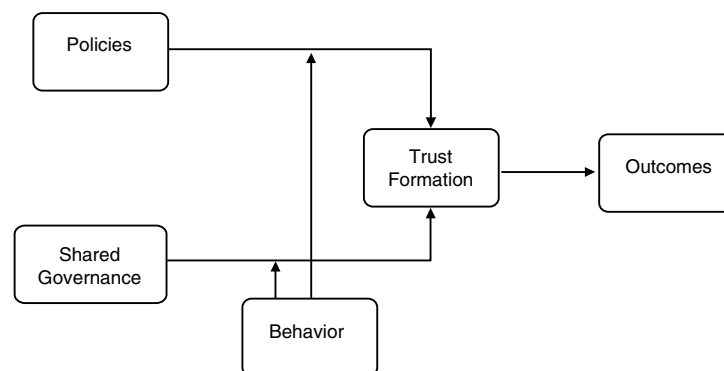


Figure 1. Theoretical Framework.

It is necessary that both the parties including industry and universities work together to adjust their mutual agreements through relational governance. The interaction and coordination barriers can be overcome by engaging in adaptive efforts to increase cooperation and flexibility in the university-industry collaborations. The shared governance tends to involve the task related ongoing effects that are undertaken to diagnose the hurdles faced in the management of project effectiveness. Effective collaboration and team work can also be maintained through coordinating goals and skills between both the partners (Lawson *et al.*, 2009). It helps in the adopting to new circumstances that facilitate the integration of information and enables breeding of positive vibes.

Trust is considered as an important factor in cementing university-industry collaborations, which in turn facilitates joint activities and positive outcomes (Gopalakrishnan & Santoro, 2004). The collaboration partners are better at understanding and observing knowledge from each other. Therefore, it is believed that trust facilitates the transfer of knowledge and innovation-related performance to the company researchers. The initial funding for a joint project is secured within the industry by facilitating the initial agreement with the university (Bstieler *et al.*, 2015).

## Methods

The study protocol was approved by the Ethical Committee of the American University in the Emirates (AUE/VPRA/Letter/08/18). Signed informed consent forms were obtained from the participants, which ensured their confidentiality and confirmed their participation for the study.

A university-wide quantitative research study was conducted at the American University in the Emirates between June and August 2018. Data collection started after ethical approval was received in August 2018. A total of 100 head of departments and senior professors from 20 public and private universities in the UAE have been utilized for the purpose. Participant selection was based on a non-probability approach and participation was undertaken voluntarily. It was imperative to select participants who felt comfortable to express their opinions and attitudes since the study aims to investigate the relationship between university and industry.

Participants were recruited at the university via a university email list, and their ideas, attitudes, and opinions were clearly communicated. The participants were given questionnaire that included their concerns regarding curriculum of university and their relationship with relevant industries (*Extended data*). All the questionnaires were provided to the potential participants using their email. The questionnaire has been adopted from a previous study conducted by Bstieler *et al.* (2015). The self-administered questionnaire was filled by the participants in the university only. The items of questionnaire were developed considering the challenges they face, both inside and outside the university campus in relationship to their standing amongst other universities and their relationship with relevant industries in UAE. The questionnaire helped in the assessment of the major

challenges faced by the university in building strong university-industry relationship affecting further the employability of graduates.

Preliminary informants in each firm were questioned in detail about the questionnaire. Major emphasis has been placed to gather views of teachers and professors regarding the role of university's academic capability and its credibility to build good relations with industries.

All key variables in this study were measured with 5-point multi-item Likert scale. The results obtained through the questionnaire were analyzed through Statistical Package of Social Sciences (SPSS) version 20.0. Regression and factor analysis test will help in proper understanding of major factors, influencing the relationship between the university and industry.

## Results

Table 1 presents descriptive statistics for the variables examined in the study. The data has been analyzed through SPSS v.20 using factor loadings and regression analysis. This approach has consequently provided the researcher an opportunity to examine the factors that influence the relationship between the university and industry. Table 2 presents correlation analysis between dependent and independent variables of the study. The findings have indicated that basic research ( $r = 0.076$ ), UI collaboration on experience ( $r = .019$ ), IP policies ( $r = .094$ ), shared governance ( $r = 0.067$ ), trust ( $r = 0.045$ ) and knowledge transfer ( $r = 0.011$ ) are positively and significantly correlated with shared knowledge, trust formation and innovative performance.

Table 3 shows regression analysis for the main study variables. The findings have indicated that there is a significant and

**Table 1. Descriptive statistics as calculated from Likert scale questionnaire about university-industry relations in United Arab Emirates.**

|                             | Mean   | Std. Deviation |
|-----------------------------|--------|----------------|
| Firm Size                   | 4.4700 | .68836         |
| Project Length              | 4.4700 | .78438         |
| Basic Research              | 4.4200 | .75452         |
| UI Collaboration Experience | 4.5200 | .77172         |
| UI Collaboration Importance | 4.5500 | .57516         |
| IP Policies                 | 4.5200 | .62732         |
| Shared Governance           | 4.4500 | .74366         |
| Trust                       | 4.5200 | .70324         |
| Knowledge Transfer          | 4.5300 | .61060         |
| Innovation Performance      | 4.4800 | .67390         |
| Valid N (listwise)          |        |                |

UI, university-industry; IP, intellectual property

**Table 2. Correlation analysis on a questionnaire about university-industry relations in United Arab Emirates.**

|                             |                     | Correlations |                |                |                             |                             |             |                   |       |                    |                        |
|-----------------------------|---------------------|--------------|----------------|----------------|-----------------------------|-----------------------------|-------------|-------------------|-------|--------------------|------------------------|
|                             |                     | Firm Size    | Project Length | Basic Research | UI Collaboration Experience | UI Collaboration Importance | IP Policies | Shared Governance | Trust | Knowledge Transfer | Innovation Performance |
| Firm Size                   | Pearson Correlation | 1            |                |                |                             |                             |             |                   |       |                    |                        |
|                             | Sig. (2-tailed)     |              |                |                |                             |                             |             |                   |       |                    |                        |
|                             | N                   | 100          |                |                |                             |                             |             |                   |       |                    |                        |
| Project Length              | Pearson Correlation | .111         | 1              |                |                             |                             |             |                   |       |                    |                        |
|                             | Sig. (2-tailed)     | .273         |                |                |                             |                             |             |                   |       |                    |                        |
|                             | N                   | 100          | 100            |                |                             |                             |             |                   |       |                    |                        |
| Basic Research              | Pearson Correlation | .122         | .141           | 1              |                             |                             |             |                   |       |                    |                        |
|                             | Sig. (2-tailed)     | .228         | .162           |                |                             |                             |             |                   |       |                    |                        |
|                             | N                   | 100          | 100            | 100            |                             |                             |             |                   |       |                    |                        |
| UI Collaboration Experience | Pearson Correlation | -.008        | .076           | .107           | 1                           |                             |             |                   |       |                    |                        |
|                             | Sig. (2-tailed)     | .934         | .452           | .290           |                             |                             |             |                   |       |                    |                        |
|                             | N                   | 100          | 100            | 100            | 100                         |                             |             |                   |       |                    |                        |
| UI Collaboration Importance | Pearson Correlation | -.149        | -.019          | .044           | .009                        | 1                           |             |                   |       |                    |                        |
|                             | Sig. (2-tailed)     | .138         | .851           | .662           | .928                        |                             |             |                   |       |                    |                        |
|                             | N                   | 100          | 100            | 100            | 100                         | 100                         |             |                   |       |                    |                        |
| IP Policies                 | Pearson Correlation | .083         | .094           | -.082          | -.084                       | -.101                       | 1           |                   |       |                    |                        |
|                             | Sig. (2-tailed)     | .410         | .354           | .418           | .404                        | .318                        |             |                   |       |                    |                        |
|                             | N                   | 100          | 100            | 100            | 100                         | 100                         | 100         |                   |       |                    |                        |
| Shared Governance           | Pearson Correlation | .135         | .067           | -.034          | .099                        | -.065                       | .013        | 1                 |       |                    |                        |
|                             | Sig. (2-tailed)     | .180         | .510           | .735           | .329                        | .521                        | .898        |                   |       |                    |                        |
|                             | N                   | 100          | 100            | 100            | 100                         | 100                         | 100         | 100               |       |                    |                        |
| Trust                       | Pearson Correlation | -.072        | -.045          | -.111          | -.131                       | .060                        | -.093       | .089              | 1     |                    |                        |
|                             | Sig. (2-tailed)     | .478         | .659           | .271           | .194                        | .554                        | .360        | .379              |       |                    |                        |
|                             | N                   | 100          | 100            | 100            | 100                         | 100                         | 100         | 100               | 100   |                    |                        |
| Knowledge Transfer          | Pearson Correlation | -.046        | .150           | -.006          | -.012                       | -.091                       | .170        | -.086             | -.037 | 1                  |                        |
|                             | Sig. (2-tailed)     | .650         | .138           | .955           | .906                        | .370                        | .091        | .397              | .717  |                    |                        |
|                             | N                   | 100          | 100            | 100            | 100                         | 100                         | 100         | 100               | 100   | 100                |                        |
| Innovation Performance      | Pearson Correlation | -.078        | .028           | -.063          | .001                        | -.036                       | -.047       | -.093             | -.191 | .087               | 1                      |
|                             | Sig. (2-tailed)     | .443         | .786           | .535           | .994                        | .719                        | .644        | .359              | .057  | .387               |                        |
|                             | N                   | 100          | 100            | 100            | 100                         | 100                         | 100         | 100               | 100   | 100                | 100                    |

UI, university-industry; IP, intellectual property

**Table 3. Regression analysis on a questionnaire about university-industry relations in United Arab Emirates.**

| Independent variables       | Dependent variable |       |                        |
|-----------------------------|--------------------|-------|------------------------|
|                             | Knowledge transfer | Trust | Innovation performance |
| <b>IP Policies</b>          | 0.045              | 0.067 | 0.069                  |
| <b>Shared Governance</b>    | 0.335              | 0.018 | 0.034                  |
| <b>Scientific Knowledge</b> | 0.023              | 0.017 | 0.018                  |

IP, intellectual property.

positive impact of IP policies ( $p = 0.045$ ) and scientific knowledge ( $p = 0.023$ ) on knowledge transfer. Moreover, results have shown that IP policies ( $p = 0.067$ ), shared governance ( $p = 0.018$ ) and scientific knowledge ( $p = 0.017$ ) positively and significantly influence trust. Similarly, innovation performance is affected by IP policies ( $p = 0.069$ ), shared governance ( $p = 0.034$ ) and scientific knowledge ( $p = 0.018$ ).

Table 4 presents factor loading, which indicates the influence of each item on its respective variable. From the findings, it has been indicated that shared governance is influenced when employees are mutually planning their work. Similarly, frankness in dealing significantly influenced trust among both dealers. R&D themes have significantly influenced on the knowledge transfer of the university industry collaboration. New patent applications have positively influenced innovation performance in the university industry collaboration.

## Discussion

The findings have indicated that trust, shared governance and innovation performance are significant factors influencing university-industry collaboration. Similarly, knowledge transfer is also improvised in terms of R&D themes and scientific knowledge. In contrast, the university faces multiple challenges in developing relationships with industries. The technological gap and lack of financial resources are major components, which causes hindrance in developing industrial relationships. It poses difficulties for students in seeking employment after completion of their studies. The job market provides limited opportunities of employment. Therefore, it is necessary for the universities to develop a liaison with industries so that the students are able to get jobs. Internships can prove to be helpful in developing technical skills and understanding the requirements of job market (Oyelaran-Oyeyinka & Adebawale, 2012). The universities can handle this issue by developing a mechanism for developing industrial relationships. However, the findings of the current study have indicated that knowledge transfer among universities assisted them to collaborate extensively with industries.

The challenges in collaboration between industries and universities involve culture compatibility, collaborative experiences, absence of qualified staff and not understanding job market

**Table 4. Factor loadings on a questionnaire about university-industry relations in United Arab Emirates.**

|  | Factor Loading |
|--|----------------|
| <b>Firm Size</b>                                 | .666           |
| <b>Project Length</b>                            | .643           |
| <b>Basic Research</b>                            | .591           |
| <b>UI Collaboration Experience</b>               | .578           |
| <b>UI Collaboration Importance</b>               | .593           |
| <b>IP Policies</b>                               | .615           |
| Clear IP Policies                                | .751           |
| Flexible IP Policies                             | .704           |
| <b>Shared Governance</b>                         | .713           |
| Mutually Responsible                             | .578           |
| Mutually Planned                                 | .620           |
| Mutually reevaluated                             | .522           |
| <b>Trust</b>                                     |                |
| Frank in Dealing Process                         | .732           |
| Reliable   | .497           |
| Honest   | .676           |
| <b>Knowledge Transfer</b>                        |                |
| R&D Themes                                       | .695           |
| Scientific Knowledge                             | .643           |
| <b>Innovation Performance</b>                    |                |
| New Patent Applications                          | .721           |
| New products Deployed                            | .663           |
| Extraction Method: Principal Component Analysis. |                |

UI, university-industry; IP, intellectual property

components. In this regard, the findings of the present study have shown that mutual understanding and planning gives employees better opportunities to resolve challenges in collaboration between industries and universities. In order to resolve these issues, it is necessary to define responsibilities and goals. There should be a presence of joint collaborative and project planning mechanism. This will help in developing a standard policy between educational institutions and universities (Roshani *et al.*, 2015). The cultural adaptation, understanding market requirement and skills required by the companies would be helpful in facilitating the students so that they are able to get jobs easily. It is necessary for policy makers to understand the market environment and complexities of the job market in developing a future plan. A healthy and professional working relationship can only be established if universities and companies promote innovation. Following typical standards and procedures might not prove to be effective.

The need for developing a healthy partnership between industries and universities is increasing with time. It helps in creating job opportunities for local people. According to [Kaklauskas et al., \(2018\)](#), the formation of an evaluation mechanism for establishing industry and university partnership is necessary. A framework has been proposed to cope up with the challenges of the job market. Understanding micro components, macro components and meso components is essential in developing a standard mechanism for promoting strong relationships between industries and universities. Developing a standard strategy for developing industrial relationships has a significant impact in bringing stability in the economic market. A study conducted by [Rantala & Ukko \(2018\)](#) considered case studies for exploring the implementation practices and challenges of performance management to manage collaboration between university and industry. The results depicted that small and medium enterprises are more concerned with efficient societal level outputs by the innovation networks of university and industry. It is possible that the university management face intense challenges to understand the goals of funding programs.

The authorities need to identify risk components, challenges and success factors in order to develop a policy for industry and university collaboration. The unavailability of resources, lack of technical knowledge and absence of qualified professionals is a major hurdle in developing a collaboration between the different market sectors and universities. Furthermore, lack of commitment, skills, training, organizational factors and privacy concerns also provide hindrance in the formation of a collaborative environment between companies and universities ([Garousi et al., 2016](#)). However, the current findings have opposed the aforementioned findings and indicated that organizational factors are significant in influencing transfer knowledge, innovative performance and trust. Universities and companies should collaborate with one another on a regular basis so that the technological gaps can be identified. Furthermore, it will help the universities in developing a healthy relationship with the different industrial sectors ([Garousi et al., 2016](#)). Collaboration between industries and universities plays a significant role in maintaining sustainability in the financial system. Economic growth is linked with the job market and employment ratio.

Developing a healthy relationship between industries and universities helps in reducing the unemployment ratio. However, there are a few challenges which makes it difficult to develop a collaborative relationship. These factors include behavioral barriers as the firms are reluctant to allow the students employment opportunities as they do not have any professional experience. Furthermore, the industrial organizations do not provide enough incentives for fresh graduates which results in demotivating the individuals. Therefore, there is a need for government to formulate a policy which encourages both the corporations and universities to develop a professional relationship. The innovation barriers present in organizations does not encourage changing company's policies ([Filippetti & Savona, 2017](#)). There is a need for developing an environment in which the industries and universities are able to collaborate with each other. Relevant changes in the states' policies should be

made and the focus should be towards establishing new industries so that sufficient employment opportunities are created for local people. Another study showed and supported the findings of the current study that universities aim to provide consistency in external and internal interfaces by offering key stakeholder insights ([Chau et al., 2017](#)).

The challenges that are faced by organizations and universities can be resolved through developing a university-industry liaison plan. Furthermore, the government should offer the opportunity for financial funding for research and professional development to private universities so that they are able to contribute to the national economy through research and improve available resources. The focus of the universities should also be towards enhancing the technical knowledge of their staff members. Hence, there is a need for a separate department to be established by the university to develop liaison with the industries. Furthermore, specialized individuals should be hired by the university management for developing a relationship with different industries. On the other hand, the firms should also change their attitudes and encourage the universities to collaborate with the organization. The companies should provide relevant support to the universities ([Bower, 2018](#)). In long-term university-industry collaboration helps in the development and maintenance of trustful collaboration by conducting reciprocal communication along with effective decision-making processes ([Bstieler et al., 2017](#)). The companies should visit the universities on a regular basis and develop a collaborative working culture.

## Conclusion

This study has set out to examine the relationship between the universities and the industries of UAE and propose influential factors that can overcome the challenges experienced by universities in collaborating with the industries. Moreover, the study depicted missing links in the association between universities and organizations and proposes effective measures to overcome the challenges affecting their collaboration. Innovation performance, trust and knowledge transfer have been the most influential factors between the university and industry collaboration. The effective collaboration between university and industry is increased as a result of technological advances and widespread increase in the global knowledge. The results have depicted the importance of university-industry collaborations for increasing trust, innovations, and shared governance.

The holistic amalgamation of university-industry collaboration is important as organizations cannot work in isolation to foster economic growth and create new ideas for innovation. Universities are likely to provide the best education by creating ever-expanding new knowledge base and new ideas within industry. Future studies should focus on the role of interorganizational governance mechanisms in university-industry collaborations in reference to the role of innovation. This study has used quantitative research design to examine a specific objective, while a qualitative research design should be adopted to examine the views and perceptions of employees towards university-industry collaborations.

## Data availability

### Underlying data

Open Science Framework: Challenges in developing university-industry relationship: Quantitative evidence from higher education institutions in the UAE. <https://doi.org/10.17605/OSF.IO/2FZ56> (Singh, 2019).

This project contains the following underlying data:

- Questionnaire responses from respondents (n=100). Responses are based on a Likert scale.

### Extended data

Open Science Framework: Challenges in developing university-industry relationship: Quantitative evidence from higher

education institutions in the UAE. <https://doi.org/10.17605/OSF.IO/2FZ56> (Singh, 2019).

This project contains the following extended data:

- Questionnaire.

### Grant information

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# Open Peer Review

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Not only is the topic of interest and importance, but the context of the Middle East representative by the UAE.

The introduction is well written and clear. More specifically, the main objective of this study was to evaluate the missing links in the relationships between universities and the organizations and industries of UAE, and propose measures to overcome the challenges, faced by universities in collaborating with the industries to overcome the relationship barriers.

The theoretical framework too is clear and depicted by a figure. Perhaps more recent references such as the following needs to be included:

Vel, P., Shah, A., Mathur, S., Pereira, V. (2019) "Internal marketing in a higher education context – towards an enriched framework", *International Journal of Educational Management*, Vol. 33 Issue: 1, pp.5-27<sup>1</sup>.

The empirical section is fine and contributes to the research objective. Overall, though, the discussion section and conclusion sections should reiterate the contributions.

### References

1. Vel P, Shah A, Mathur S, Pereira V: Internal marketing in a higher education context – towards an enriched framework. *International Journal of Educational Management*. 2019; **33** (1): 5-27 [Publisher Full Text](#)

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

Yes

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Yes

**Is the argument information presented in such a way that it can be understood by a non-academic audience?**

Yes

**Does the piece present solutions to actual real world challenges?**

Yes

**Is real-world evidence provided to support any conclusions made?**

Yes

**Could any solutions being offered be effectively implemented in practice?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** My expertise is in international business, human capital, strategy and social issues

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Reviewer Report 16 May 2019

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**Supran Kumar Sharma**

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Kashmir, India

Level of development of an economy is critically designed by the progression of secondary sector where prominent role is played by industrial sector. Whereas the pace of growth of industrial sector is directly correlated with level of skills and intellect imbibed by the human resources. The present work is empirical in nature to assess status of UAE on these lines. Well structured theoretical framework has been prepared in the study measuring antecedents and consequent of university-industry collaboration. Applying appropriate tools including correlation, regression analysis and exploratory factor analysis, the study concluded that there is statistically significant impact of intellectual property and scientific knowledge on knowledge transfer. The study can be a milestone to have future research on the university industry relationship by more deeply and at micro level measuring the relationship among factors like trust, confidence, shared governance, knowledge transfer, innovations, scientific knowledge etc.

Although the study is empirical in nature and effectively written. However, the flow of writing may be improved. Policy implications could have been improved. The tools used for the estimation of relationship are effectively have been used to for the purpose which are providing base accepting the results of the study. The study may be accepted.

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

Yes

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Yes

**Is the argument information presented in such a way that it can be understood by a non-academic audience?**

Yes

**Does the piece present solutions to actual real world challenges?**

Yes

**Is real-world evidence provided to support any conclusions made?**

Yes

**Could any solutions being offered be effectively implemented in practice?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Econometrics

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

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