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### Factors Impacting University–Industry Collaboration in Asian Countries

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**Abstract.** The research report significantly discusses the issues faced by the students in getting proper knowledge due to a gap between university and industry. The research significantly focuses on bringing a collaborative culture between industry and university such that proper knowledge could be imparted to the students that are significantly industry based. Thus, the research proposes in up skilling the students so that their employability prospects improves significantly.

University-industry collaboration is important to assess in terms of establishing an entrepreneurial point of view. In this context, the chapter presents findings in the form of establishing relationships among the variables for the survey. The selection of the variables has been done considering the factors that influence the current scenario of university-industry relationships in Asia.

**Key words:** universities, industry, entrepreneurial thinking, student qualifications, employment problems.

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Научная статья

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### Факторы, влияющие на сотрудничество университетов и промышленности в азиатских странах

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**Аннотация.** В настоящем исследовании широко обсуждаются проблемы, с которыми сталкиваются студенты при получении надлежащих знаний из-за разрыва между университетом и промышленностью. Исследование в значительной степени сосредоточено на создании культуры сотрудничества между промышленностью и университетом, чтобы надлежащие знания могли быть переданы студентам, которые в значительной степени основаны на промышленности. Таким образом, исследование предлагает повысить квалификацию студентов, чтобы их перспективы трудоустройства значительно улучшились. Сотрудничество между университетами и промышленностью важно оценивать с точки зрения установления предпринимательской точки зрения. В этом контексте в главе представлены результаты в виде установления взаимосвязей между переменными для обследования. Выбор переменных был сделан с учетом факторов, влияющих на текущий сценарий отношений между университетами и промышленностью в Азии.

**Ключевые слова:** университеты, промышленность, предпринимательское мышление, квалификация студентов, проблемы трудоустройства.

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## 1. Introduction

### 1.1. Introduction

The research topic significantly discusses the importance and significance of developing collaboration between universities and industries in order to achieve growth and prosperity in the global economy. The research topic sheds light upon the advantage that the individuals would receive if they get industry exposure while carrying out their university study which would improve their employability skills. Furthermore, the students would gain a significant skill set related to the effective management of business and the efficient tackling of employees such that the productivity of the organization would increase manifold. Hence, these major learning would be gathered from the research study.

### 1.2. Background of the research

The research significantly sheds light upon the importance of developing a union between universities and industries in the Asian countries in order to improve the quality and efficiency of the citizens. According to the words of de Wit-de Vries et al. [de Wit-de Vries 2019], the effective collaboration between university and industry would allow the students to upskill themselves of the latest technology available so that they can bring innovation and growth in the organization. Moreover, the overall economic development of

the organization would also be achieved through the growth of the GDP of the country due to the collaboration. The unemployment rate in the UK is around 3.8% as per recent data analysis of the year 2022 and this has been due to the lack of proper knowledge among the individuals [Statista 2022]. The collaboration between industries and universities would make the students industry ready and would develop practical experience within them. Thus, they would be able to take up challenges in the workspace and could make strategic decisions whenever necessary in order to optimize the work efficiency of the organization they are working for.

### 1.3. Problem statement or Rationale

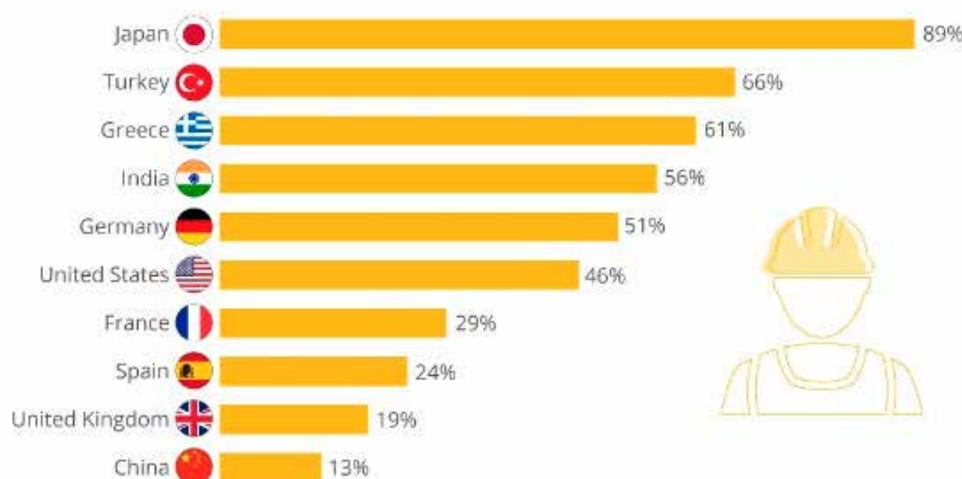
The major issues related to the research topic are the inefficiency of the employees in performing the desired tasks significantly after they graduate from their universities. According to the words of Rybnicek & Königsgruber [Rybnicek 2019], the collaboration between university and industry would allow the development of a practical mindset in the individuals. The fresh college graduates would get industry experience beforehand so that they can perform at their optimum capacity during their employment in the organization.

The issue is significant because people would significantly grow the intellect of making practical decisions in the workspace based on situational analysis. Hence, their overall productivity and valuation in the market would significantly improve due to the effective collaboration between the university and industry in a global perspective.

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## The Countries Facing The Greatest Skill Shortages

Share of companies\* affected by skill shortages in selected countries (2018)



**Figure 1.1.** Skill shortages faced by significant countries  
Source: [Statista 2019]

The above graph elaborately shows the skill shortage that is faced by developed countries due to the gap in proper knowledge present in the individuals. According to Statista [Statista 2019], Japan ranks the highest in shortage of skills, having a percentage of 89%. Moreover, Turkey has taken up the second position with 66% of the population facing skill shortage. Moreover, Greece has faced a skill shortage of 61% due to the lack of collaboration between universities and industries. India has taken up the fourth position with 56% of the population having no proper skill set and thus falls under the unemployment category. The United States has also faced a skill shortage among their individuals, which adds up to a percentage of 46%. Hence, these values suggest that it is vital to bridge the gap in knowledge between universities and industries so that the students get industrial and business management knowledge beforehand in order to improve their overall work efficiency. The shortage of skills is still a major issue now since effective collaboration between universities and industries have not yet fully attained.

#### 1.4. Research Aim, Objectives and questions

##### *Aim*

The aim of the research is to develop strategies that would effectively reduce the gap between education and industrial knowledge received by individuals for achieving organizational development and economic growth.

##### *Objectives*

The major research objectives that could be developed are:

- To identify the concept of skill development through integrating industrial knowledge with university education
- To evaluate the impact of effective collaboration between universities and industries on the mindset of the students
- To introduce the challenges that are faced in bridging the gap between proper knowledge development and growth of practical skills
- To recommend some strategies of mitigating skill shortage among individuals for achieving GDP growth in the economy.

##### *Questions*

The major research questions that could be achieved from the objectives are:

Q.1. What is the concept of skill development and the growth in knowledge base among budding students?

Q.2. How can the ineffectiveness of the employees be reduced through the imparting of proper knowledge to individuals?

Q.3. What are the challenges faced in the proper implementation of industrial knowledge in university curriculum?

Q.4. What are the recommended strategies for mitigating the skill shortage of labourers in different countries?

#### 1.5. Research gap

The significant research gap that has been faced by researchers during the conduction of the research is the lack of data and information from different sources mostly related to the online source. The online journals and research papers were not sufficient to provide knowledge of mitigation strategies related to skill shortage. Thus, these are the major gaps in the research faced during the research work.

#### 1.6. Significance of the research

The major significance of the research is to identify the problems that are being faced by management for the effective collaboration between universities and industries. According to the words of Bertello et al. [Bertello 2022], the collaboration between universities and industries are getting hampered due to lack of management knowledge as well as lack of proper infrastructure. Hence, the research has been conducted in order to develop management strategies that would allow the proper integration of universities and industries in order to achieve organisational prosperity. Moreover, the research sheds light upon the importance of having a proper skill set among the individuals in order to achieve growth in self performance so that both personal and professional goals could be effectively achieved [Ravi 2022]. The lack of proper knowledge that is being imparted at college level is affecting the critical thinking of the individuals. According to the words of Jussila et al. [Jussila 2020], the effective integration between university and industry would allow the increase in rapid production process leading to high profits for the organisation. Hence, the overall efficiency of the employees would grow and they would be able to contribute to the proper research and development process. Hence, this would lead to significant growth in the GDP of the global economy.

#### 1.7. Summary

The concluding factors that could be achieved

from the research is that proper integration between university and industry would be required in order to achieve effective skill development in individuals. Thus, the requirement of effective leaders and professors are required so that the collaboration could be attained leading to the development of skilled labours in the market. The diverse findings from the graphs and charts have been effectively obtained in this chapter. Hence, the introduction chapter has provided valuable insights related to the rationale of the research showing the prevalent issues that are faced during the collaboration between university and industry.

## **2. Methodology**

### **2.1. Introduction**

This chapter significantly discusses the research methodology that needs to be adopted in order to effectively complete the entire research. The positivism philosophy has been adopted here in order to carry out primary research with a sample space of 200 participants. The random sampling technique has been chosen such that relevant data is collected related to the research topic. The methodology part shows the process of developing proper hypotheses in order to effectively answer the research questions. The overall reliability and validity of the research gets developed due to effective research methodologies that are adopted in conducting the research.

### **2.2. Conceptual framework**

#### ***Skillss***

### **2.3. Research philosophy**

The research philosophy provides a strategy and proper mindset that needs to be followed by the researcher in order to obtain effective research results. The underlying issues could be identified and proper mitigation strategies could be suggested by the researchers in order to bring sufficient outputs. The research philosophy uses factual data for the analysis of the problem statement in order to gain solutions to the research problem areas. The different types of research philosophies used in the research are positivism, interpretivism and realism. The Positivism philosophy has been chosen here for conducting the research.

#### ***Justification***

The justification behind choosing the positivism philosophy is because it allows the collection and analysis of factual data so that proper research results could be obtained. The scholars use quantitative

data analysis in the positivism philosophy to obtain results in the form of charts and graphs in order to carry out relevant analysis. According to the words of Kaklauskas et al. [Kaklauskas 2018], the positivism philosophy allows the scholars to identify trends and patterns in the research topic and also helps in developing the future scope of the research. The possible research questions that are developed could be answered using the chosen research philosophy. The chosen research philosophy follows a well defined structure during studies in order to complete the research in an effective manner. The human experience is mostly focused on through the chosen research philosophy. Proper observations are being carried out related to the understanding of the lacunas faced during the collaboration between universities and industries [Akbar 2021]. Due to the effective observational process proper mitigation strategies could be achieved for reducing the skill gap among the employees and labourers working in big conglomerates. The chosen research philosophy allows the logical interactions between research variables in order to obtain practical findings to the research problems statement.

### **2.4. Research approach**

The research approach provides a detailed plan to the researchers that allows the researcher to be on track during the research work. Thus, the research approach allows a smooth, effective and manageable process for the scholars to carry out their research. The research approach helps in developing a research hypothesis in order to effectively answer the research questions. The development of a theoretical framework also takes place using a proper research approach. The different types of research approach used by the researchers are deductive, inductive and abductive approaches. The deductive research approach has been chosen here for conducting the research.

#### ***Justification***

The justification behind choosing the deductive research approach is because it helps in forming research hypotheses that would significantly allow the effective completion of the entire research. According to the words of Marsonet [Marsonet 2019], the chosen research approach provides a theoretical framework that would allow the scholar to follow a roadmap for the effective completion of the research topic. The research problem is significantly observed using the chosen research approach so

that proper solutions could be suggested to the research problem areas. The causal relationships could be developed between the research variables and the theoretical concepts could be measured in a quantitative manner. The comparison between the mindset of individuals coming from university and industrial background can be significantly achieved through the chosen research approach. Moreover, a bridge could be developed between university and education in order to reduce the education gap and lack of skill set among the employees. The chosen research approach would help to deduce proper conclusions based on the answers to the hypothesis questions. Critical data collection and analysis are carried out in relation to the effective process that is to be adopted for reducing the skill shortage in major countries. Moreover, the chosen research approach would help in bringing collaboration between universities and industries in order to impart practical knowledge to students.

### **2.5. Research design**

The formulation of a research design allows the researcher to make effective decisions related to the research topic so that proper conclusions could be drawn for the research topic. The different tasks that are to be carried out in the research to make it successful are elaborately discussed in the research design. The major significance of the research design is that it forms a pathway for the researcher to follow in order to complete the research process. The different types of research design that are used for conducting the research are descriptive, correlational, experimental research design. The descriptive research design has been selected here for conducting the research effectively.

#### ***Justification***

The justification for the selection of the descriptive research design is that it helps in the statistical analysis of the data such that proper inference could be drawn in relation to the research topic. According to the words of Woiceshyn & Daellenbach [Woiceshyn 2018], the chosen research design uses the factual analysis of the data in order to improve the authenticity of the results obtained. Furthermore, the chosen research design helps in identifying the problem statement of the research and allows the development of a future scope for the research. Moreover, diverse data set could be obtained using descriptive data collection techniques such as surveys, observations and case

study process. Hence, proper collection of data and its analysis could be done using statistical tools in the chosen research design method. The actual reason for the knowledge gap in employees and labours could be identified through the chosen research design. The quantitative representation of the data could be obtained and proper statistical tools are to be used for effective analysis of the collected data. Hence, these are the major reasons for the selection of descriptive research design.

### **2.6. Data collection method**

The data collection method significantly deals with the proper collection of data in order to effectively answer the research questions related to the research topic. Based on the requirement of the research effective data collection method is opted in order to validate the entire research. The different types of data collection methods are primary and secondary data collection method. The primary data collection method allows the collection of factual data such that effective interpretation of the research topic could be explained compared to secondary data collection analysis. The primary data collection technique has been chosen here for conducting the research.

#### ***Justification***

The justification for choosing the primary data collection technique is because the research topic requires the collection of factual data in order to provides a justified answer to the research problem statement. Moreover, the use of statistical tools allows effective analysis of the data such that justified results are obtained related to the research topic. According to the words of Atmowardoyo [Atmowardoyo 2018], the chosen data collection technique allows the usage of surveys and questionnaire for obtaining the answers. The respondents chosen for answering the survey could be random or purposive depending on the research problem statement. Moreover, the data collected would purposefully provide solution to the education gap faced by the students that significantly hampers their growth in the employment domain.

### **2.7. Sampling technique and sample size**

The sampling technique and sample size allows the effective collection of response from the participants that would improve the authenticity of the research results. The different types of sampling techniques are random and purposive sampling techniques. The random sampling technique has been selected here for obtaining response through

questionnaires.

### **Justification**

The major reason for selection of the chosen sampling technique is because the research is based on factual data collection and analysis. According to the researcher Franzitta et al. [Franzitta 2020], the chosen sampling technique improves the authenticity of the research since the data obtained are practical in nature and can effectively solve the research problem statement. The sample size of 200 participants has been selected here in order to gather enough data that would provide effective mitigation strategies for up skilling the employees during their university period. Hence, the employees would be able to generate significantly profits for the organization by making the business process more efficient and highly optimized in nature.

### **2.8. Reliability and validity**

The reliability and validity of the research could be obtained by the authentic collection of the data and its proper analysis. Thus, the scholar proposes to gather data from survey by using random participants. The questions developed in the survey are directly related to the problem statement and hence would be able to answer the research problem thoroughly. Moreover, the proper presentation of the data using the statistical tools by the scholars improves the validity of the research and also serves the purpose of the research. Hence, these are the major factors that promotes reliability and validity of a study.

### **2.9. Ethical considerations**

The major ethical considerations that are practiced while conducting the research is the identity of the participants are to be kept anonymous. Moreover, the data collected from the participants are to be used only for research purpose strictly. The participants cannot be forced to provide information and hence the survey analysis needs to be done under the sole willingness of the participants to participate in the questionnaire process.

### **2.10. Merits and Demerits of Research Approach**

The merits of the research approach are that it helps the scholars to carry out critical thinking and to solve the problem statement stated in the article. The academic prospect of the scholar develops due to the implementation of effective research approach. The major demerits is that it taken significant time and money for the effective completion of the research.

## **2.11. Project schedule**

Table 2.1. **Timeline**

Activities	Time required (in Weeks)
Create aim and objectives	1
Identify research independent and dependent variables	2
Develop literature review	1
Determine research methods	2
Collect and evaluate results	1
Documentation and submission	1

Source: Self-developed

### **2.12. Limitations of the research**

The limitations of the research was that proper information was not obtained from the participants as many individuals did not agree to participate in the questionnaire process and the research process was time consuming in nature that led to the growth of disinterest in scholars.

### **2.13. Summary**

The significant conclusion that could be drawn related to the research topic is that the research methodology allows the effective implementation of research process that needs to be followed for research completion. Moreover, the methodologies chosen in the research has been provided with proper justification for the readers to understand its significance.

## **3. Result, analysis and discussion**

### **3.1. Introduction**

This chapter presents the findings and analysis of the current research in order to attain the research. The findings section has helped in confirming or discarding the hypothesis of the research. The chapter has brought forth the result of the research and it has helped in analyzing the core of the issue. In order to collect the data, primary quantitative data has been used. In this chapter, the demographic profile has been analyzed to specify the needs and demands in general. Furthermore, normality and validity tests have been done to cross-check whether the population accumulated for the sample is normally distributed. Additionally, a reliability test has been conducted to solidify the acceptance of the research result. In this context, it is important to note that the sample size is 200. It has been conducted by scrutinizing each component of the issue, which in return has made room for inspecting the research problem from various points of view. In other words, this chapter has been able to pinpoint the way this research will be beneficial for society and science in general.

**3.2. Response rate**

The response to the questions of the survey has been collected from a group of 200 people. They have given their responses to a set of questions which includes six questions. Initially, the sample size was 400 people; however, 50% of them felt discomfort in answering the set of survey questions. The importance of establishing a correct sample size is to attain significant information that satiates the goal of the researcher. As per the statement of Lakens [Lakens 2022], the selection of the proper sample size should be done considering the resources allocated for the research. On the other hand, the researcher must construct a plan in order

to ensure the survey meets the desired outcome contemplated by the researcher. In order to plan the research, the researcher has to assess the effect of the smallest sample size in addition to the impact of the largest sample size on the research. This prior assessment will reveal the unacceptable sample size for the survey to the researcher. In this context, it is important to note that all research cannot be conducted following a traditional sampling technique. It is significant to determine the process of sampling technique prior hand in order to ensure the accuracy of the research.

**3.3. Demographic profile**

**3.3.1. Gender**

Table 3.1. Demographic o the basis of gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	65	6.5	32.5	32.5
	2	67	6.7	33.5	66.0
	3	68	6.8	34.0	100.0
	Total	200	20.0	100.0	
Missing	System	799	80.0		
Total		999	100.0		

Source: Self-developed

The current study has included participants from both genders to derive results on the basis of perspective that differs from one gender to another. As stated by Roseboom [Roseboom 2020], it is important to address the issues of gender equality in all spectrums. As per the frequency rate obtained from the survey, it can be seen that 6.5% of the participants of the survey are male, while 6.7% are

female. On the other hand, 6.8% of the participants belonged to the other category. This reveals that 65 of the participants were male, 67 of the participants were female while 68 belonged to the other category. Therefore, it can be stated that this survey has not excluded anyone on the basis of gender biases.

**3.3.2. Age**

Table 3.2. Demographic on the basis of age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	46	4.6	23.0	23.0
	2	53	5.3	26.5	49.5
	3	47	4.7	23.5	73.0
	4	54	5.4	27.0	100.0
	Total	200	20.0	100.0	
Missing	System	799	80.0		
Total		999	100.0		

Source: Self-developed

The specific research has attempted to include participants from the age starting from 20 and extends to 50 and above. The selection of participants has been considered on age as people belonging to different age groups can carry different opinions. As per the statement of Hitka et al. [Hitka 2019], the

motivation of an individual depends upon the factor of age as well. The specific survey includes 4.6% of participants who belong to 20-30 years of age. On the other hand, 5.3% of the participants belong to 30-40 years of age. On the other hand, participants who belonged 40-50 years of age filled up 4.7% of the

participants. Therefore, 46 of the participants were from the vague group of 20-30. On the other hand, 53 participants belonged to the 30-40 age groups. Exactly 47 of the participants belonged to 40-50 years of age. Most of the participants were part of the age group of 540 and above which is estimated

at 5.4%, which calculates into 54 participants. The inclusion of the participants was most focused on finding a solution to the prevalent issue.

**3.4. Data screening**

**3.4.1. Normality test for age**

Table 3.3. Normality test for age

	What_is_your_age	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Improve_the_economic_growth_of_the_country	1	.185	46	.000	.901	46	.001
	2	.212	53	.000	.889	53	.000
	3	.172	47	.001	.888	47	.000
	4	.184	54	.000	.898	54	.000
Development_of_entrepreneurial_mindset_among_students	1	.236	46	.000	.878	46	.000
	2	.191	53	.000	.882	53	.000
	3	.180	47	.001	.882	47	.000
	4	.199	54	.000	.891	54	.000
Initiate_the_growth_of_research_skills_in_individuals	1	.234	46	.000	.888	46	.000
	2	.217	53	.000	.896	53	.000
	3	.151	47	.009	.899	47	.001
	4	.195	54	.000	.906	54	.000
Develop_sustainability_mindset_among_students	1	.242	46	.000	.884	46	.000
	2	.188	53	.000	.892	53	.000
	3	.234	47	.000	.893	47	.000
	4	.216	54	.000	.888	54	.000
a. Lilliefors Significance Correction							

Source: Self-developed

Normality test is conducted with an attempt to compute the probability of an arbitrary variable of a data set to be typically distributed. As per the argument of Simamora [Simamora 2019], normality tests are part of classic assumption tests which are measured with information technology to assess the effectiveness. The objective of this analysis is to gain insight on effectiveness. As per SPSS analysis, .025 can be granted for Kolmogorov Smirnov statistics, hence all the variables can be granted. In addition, the Kolmogorov Smirnov statistic considered the sigma value of .000. Therefore, on this basis the variable of initiation of the growth of research skills in individuals can be considered to reject the null hypothesis and that this variable follows a normal

distribution. Similarly, the variable of developing sustainability mindset among students can be considered to reject the null hypothesis and that this variable follows a normal distribution. On the other hand, in case the Shapiro-Wilk test is greater than 0.05 it is normal. In this case, the statistics of the factor growth initiative among the researcher is at 0.888 and the sigma value is at 0.000. This reveals that the sigma value of Shapiro-Wilk test in case of this research, for no variable is 0.05. Therefore, it does not follow a normal distribution. In this case, Shapiro-Wilk value can be used to determine the effectiveness of this research.

**3.4.2. Normality test for gender**

Table 3.3. Normality test for age

	What_is_your_gender	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Improve_the_economic_growth_of_the_country	1	.193	65	.000	.891	65	.000
	2	.216	67	.000	.888	67	.000
	3	.193	68	.000	.897	68	.000



	What is your gender	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Development_of_entrepreneurial_mindset_among_students	1	.196	65	.000	.886	65	.000
	2	.221	67	.000	.863	67	.000
	3	.165	68	.000	.904	68	.000
Initiate_the_growth_of_research_skills_in_individuals	1	.201	65	.000	.896	65	.000
	2	.230	67	.000	.889	67	.000
	3	.166	68	.000	.909	68	.000
Develop_sustainability_mindset_among_students	1	.222	65	.000	.891	65	.000
	2	.216	67	.000	.893	67	.000
	3	.224	68	.000	.863	68	.000

a. Lilliefors Significance Correction

Source: Self-developed

The gender distribution of the survey participants is put under the microscope to determine whether it follows the measures of normality test or not. As per the statement of Asrizal et al. [Asrizal 2018], normality tests are conducted to test and analyze the data collected for the purpose of the research. Shapiro-Wilk statistics grants a value that is more than .05. Therefore, all the variables in this research fail to meet the standard and cannot be considered normal. On the other hand, the Kolmogorov-Smirnov value can be considered a statistics value of .025 and the sigma value at 0.000. The sigma value, when more than 0.001 cannot be considered a null hypothesis. Therefore, all the variables meet the statistics as well as the sigma value of Kolmogorov-Smirnov. In this way, the effectiveness of the accumulated data on the gender normality test has been measured.

### 3.4.3. Reliability statistics

Table 3.5. Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.192	.071	4

Source: Self-developed

Reliability statistics are significant in analyzing data while conducting research because it is used to assess consistency in research. In the case of SPSS analysis, the same variables are assessed a number of times against one another. Therefore, a reliability test has been done to comprehend the metrics of consistency in the scope of this specific research. As per the statement of Belur et al. [Belur 2021], reliability tests are necessary in case of instances when multiple variables are utilized in order to make a decision. The aspect of Cronbach's Alpha based on standardized items traces the variances or dissimilarities amongst the variables; it specifically establishes the inter-relationships among the

variables. The notion that all the variables have equal inter-relationships can be wrong in many cases. In addition to this, it is important to note that Cronbach's Alpha bears great acceptance when it is above 0.70 and even higher. In this case, Cronbach's Alpha is at 0.192 and Cronbach's Alpha Based on Standardized Items is at 0.071. Therefore, it can be stated that the research falls short of the reliability measures suggested by Cronbach's Alpha.

### 3.4.4. KMO and Bartlett's Test

Table 3.6. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.874
Bartlett's Test of Sphericity	Approx. Chi-Square	1309.760
	df	15
	Sig.	.000

Source: Self-developed

The KMO and Bartlett's Test is conducted to measure all the data that has been accumulated for the purpose of the research. In fact, the objective of a KMO test is to evaluate the competency of the correlation among the variables. On the other hand, the objective of utilizing Bartlett's test is to assess whether the variable matrix is an identity matrix or not. The result indicates whether the variables are related or not to each other. The importance of conducting a validity test through KMO is to assess the co linearity of a single variable against all the other variables. On the other hand, each one of the variables can be calculated in order to find the strength of the correlation of each variable against one another. The four variables considered for this research should be compatible with one another in terms of validity. As per the statement of Astuti & Soliha [Astuti 2021], the KMO value is more than 0.5 and when its significance is less than 0.05, and then afterwards, the sample can be considered valid. In this respect, it can be stated that the KMO value

for this research is at .874 which is more than 0.5 and Barlett's test at 1309.760 is far more than 0.05. In fact, while the generated value is more than 0.4, it becomes acceptable. Therefore, the final result of this particular research has gained substantial correlation in terms of the variables.

### 3.5. Summary

The chapter provides an in-depth insight into the analysis of the accumulated data. The chapter evaluates all four of the variables against one another to assess the acceptability of the research under close scrutiny. The four variables are immensely connected

to the collaboration of universities and industries in Asian countries. It is apparent from the discussion and analysis of the data, that a reliability and validity test is conducted to assess the acceptability of the research. On the other hand, reliability and validity tests have been conducted with the objective to establish a relationship among the variables.

In addition, the statistical representation of the data has further strengthened the efficacy of the research. The consideration of response rate has been mentioned in the research.

## References

1. Akbar 2021 – Akbar A. Does Working Capital Management Influence Operating and Market Risk of Firms? By A. Akbar et al. DOI:10.3390/risks9110201. *Risks*. 2021; 9(11):201.
2. Asrizal 2018 – Asrizal A. Effectiveness of adaptive contextual learning model of integrated science by integrating digital age literacy on grade VIII students. By A. Asrizalet al. In *IOP Conference Series: Materials Science and Engineering*. 2018; 335(1):012067. IOP Publishing. Retrieved from: <https://iopscience.iop.org/article/10.1088/1757-899X/335/1/012067/pdf> (retrieved on: 15 April, 2022).
3. Astuti 2021 – Astuti J. P., & Soliha E. The Effect of Quality of Work Life and Organizational Commitment on Performance with Moderation of Organizational Culture : Study On Public Health Center Puskesmas In Gabus District. DOI: 10.5555/ijosmas.v2i6.83. *International Journal of Social and Management Studies*. 2021; 2(6), 89-99. Retrieved from: <https://www.ijosmas.org/index.php/ijosmas/article/download/83/69> (retrieved on: 15 April, 2022).
4. Atmowardoyo 2018 – Atmowardoyo H. Research methods in TEFL studies: Descriptive research, case study, error analysis, and R&D. DOI: 10.17507/jltr.0901.25. *Journal of Language Teaching and Research*. 2018; 9(1):197-204.
5. Belur 2021 – Belur J. Interrater reliability in systematic review methodology: exploring variation in coder decision-making. By J. Belur, L. Tompson, A. Thornton, & M. Simon. DOI: 10.1177/0049124118799372. *Sociological methods & research*. 2021; 50(2):837-865. Retrieved from: <https://journals.sagepub.com/doi/pdf/10.1177/0049124118799372> (retrieved on: 15 April, 2022).
6. Bertello 2022 – Bertello A. Challenges to open innovation in traditional SMEs: an analysis of pre-competitive projects in university-industry-government collaboration. By A. Bertello [et al.]. DOI: 10.1007/s11365-020-00727-1. *International Entrepreneurship and Management Journal*. 2022; 18(1), 89-104.
7. Franzitta 2020 – Franzitta V. Primary data collection and environmental/energy audit of hot mix asphalt production. By V. Franzitta [et al.]. DOI: 10.3390/en13082045. *Energies*. 2020; 13(8): 2045.
8. Hitka 2019 – Hitka M. Factors forming employee motivation influenced by regional and age-related differences. By M. Hitka, Z. Rózsa, M. Potkány & L. Ližbetinová. DOI:10.3846/jbem.2019.6586. *Journal of Business Economics and Management*. 2019; 20(4), 674-693. Retrieved from: <https://jau.vgtu.lt/index.php/JBEM/article/download/6586/8881> (retrieved on: 15 April, 2022).
9. Jussila 2020 – Jussila J. Rapid product development in university-industry collaboration: Case study of a smart design project. By J. Jussila [et al.]. DOI:10.22215/timreview/1336. *Technology Innovation Management Review*. 2020; 10(3):49-59.
10. Kaklauskas 2018 – Kaklauskas A. An evaluation system for university–industry partnership sustainability: Enhancing options for entrepreneurial universities. By A. Kaklauskas [et al.]. DOI: 10.3390/su10010119. *Sustainability*; 2018; 10(1):119.
11. Lakens 2022 – Lakens D. Sample size justification. DOI: 10.1525/collabra.33267. *Collabra: Psychology*. 2022; 8(1):

33267. Retrieved from: <https://psyarxiv.com/9d3yf/download?format=pdf> [Retrieved on: 15 April, 2022]
12. Marsonet 2019 – Marsonet M. Philosophy and logical positivism. *Academicus International Scientific Journal*. 2019; 10(19):32-36. Retrieved from: <https://academicus.edu.al/nr19/Academicus-MMXIX-19-032-036.pdf> (retrieved on: 15 April, 2022).
13. Ravi 2022 – Ravi S. (2022). Analysis of user pairing non-orthogonal multiple access network using deep Q-network algorithm for defense applications. By S. Ravi [et al.]. DOI: 10.1177/15485129211072548. *The Journal of Defense Modeling and Simulation*. 2022. ISSN: 1548-5129.
14. Roseboom 2020 – Roseboom T. J. Why achieving gender equality is of fundamental importance to improve the health and well-being of future generations: A DOHaD perspective. DOI: 10.1017/S2040174419000734. *Journal of Developmental Origins of Health and Disease*. 2020; 11(2):101-104. Retrieved from: <https://scholar.archive.org/work/fp4yf46xavbulmviy2y3gnqim/access/wayback/https://www.cambridge.org/core/services/aop-cambridge-core/content/view/4D4D209594C6EB5BA6A4F62BCDB6B86D/S2040174419000734a.pdf/div-class-title-why-achieving-gender-equality-is-of-fundamental-importance-to-improve-the-health-and-well-being-of-future-generations-a-dohad-perspective-div.pdf> (retrieved on: 15 April, 2022)
15. Rybnicek 2019 – Rybnicek R., & Königsgruber R. What makes industry–university collaboration succeed? A systematic review of the literature. DOI:10.1007/s11573-018-0916-6. *Journal of business economics*. 2019; 89(2):221-250.
16. Simamora 2019 – Simamora R. H. Socialization of information technology utilization and knowledge of information system effectiveness at Hospital Nurses in Medan, North Sumatra. DOI:10.14569/IJACSA.2019.0100916. *International Journal of Advanced Computer Science and Applications*. 2019; 10(9). Retrieved from: [https://www.researchgate.net/profile/Mohammad-Alshammari-2/publication/336266496\\_Design\\_and\\_Learning\\_Effectiveness\\_Evaluation\\_of\\_Gamification\\_in\\_e-Learning\\_Systems/links/5daee953a6fdccc99d92b461/Design-and-Learning-Effectiveness-Evaluation-of-Gamification-in-e-Learning-Systems.pdf#page=127](https://www.researchgate.net/profile/Mohammad-Alshammari-2/publication/336266496_Design_and_Learning_Effectiveness_Evaluation_of_Gamification_in_e-Learning_Systems/links/5daee953a6fdccc99d92b461/Design-and-Learning-Effectiveness-Evaluation-of-Gamification-in-e-Learning-Systems.pdf#page=127) (retrieved on: 15 April, 2022).
17. Statista 2019 – Statista (2019), skill-shortages. Available from: <https://www.statista.com/chart/4690/the-countries-facing-the-greatest-skill-shortages/> (accessed on: 27-04-2022).
18. Statista 2022 – Statista (2022), unemployment. Available from: <https://www.statista.com/statistics/279990/unemployment-rate-in-the-uk-by-country/> (accessed on: 27-04-2022).
19. de Wit-de Vries 2019 – de Wit-de Vries, E. (2019). Knowledge transfer in university–industry research partnerships: a review. By E. de Wit-de Vries, W. A. Dolfsma, H. J. van der Windt, & M. P. Gerkema. *The Journal of Technology Transfer*. 2019; 44(4), 1236-1255.
20. Woiceshyn 2018 – Woiceshyn J., & Daellenbach U. (2018). Evaluating inductive vs deductive research in management studies: Implications for authors, editors, and reviewers. DOI:10.1108/QROM-06-2017-1538. *Qualitative Research in Organizations and Management: An International Journal*. 2018; 13(1).

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## Appendices

### Appendix 1: Questionnaire

#### 1. What is your age?

1. 20-30 years
2. 30-40 years
3. 40-50 years
4. 50 and above

Factors	Percentage of respondents	Total respondents
1. 20-30 years	46	200
2. 30-40 years	53	
3. 40-50 years	47	
4. 50 and above	54	

#### 2. What is your gender?

1. Male
2. Female
3. Others

Factors	Percentage of respondents	Total respondents
1. Male	65	200
2. Female	67	
3. Others	68	

#### 3. Will it improve the economic growth of the country?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Factors	Percentage of respondents	Total respondents
1. Strongly disagree	15	200
2. Disagree	50	
3. Neutral	40	
4. Agree	51	
5. Strongly agree	44	

#### 4. Will it develop the entrepreneurial mindset among students?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Factors	Percentage of respondents	Total respondents
1. Strongly disagree	8	200
2. Disagree	29	
3. Neutral	50	
4. Agree	58	
5. Strongly agree	55	

#### 5. Will it initiate the growth of research skills in individual?

1. Strongly disagree
2. Agree
3. Neutral
4. Agree
5. Strongly agree

Factors	Percentage of respondents	Total respondents
1. Strongly disagree	22	200
2. Disagree	33	
3. Neutral	47	
4. Agree	59	
5. Strongly agree	39	

#### 6. Will it develop sustainability mindset among students?

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Factors	Percentage of respondents	Total respondents
1. Strongly disagree	8	200
2. Disagree	30	
3. Neutral	46	
4. Agree	67	
5. Strongly agree	49	