Lack of Academic-Industrial Liaison in Pakistan – A Quantitative Study

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Abstract
The primary focus of this work is to explore the causes and key limitations in Pakistan's current academic-industrial liaison. This work is aimed at highlighting the different forms and benefits and the conditions for the university-business partnership. The study has a quantitative structure and a chosen philosophy of positivism and deductive methodology, and the novel knowledge is obtained through a 5-point Likert Scale questionnaire. Pakistani organizations should help universities to use the views on education programs, learning achievements, practical training, internships and vocational training for businesses contributing to schools. The scientists at the school should also address other issues of the economy and business sector and provide the answers as a guide in the cycle for companies.
Keywords: Pakistan; Academic-industry liaison; university-business; Positivism philosophy
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INTRODUCTION

The current study focuses on the identification of the major factors of academic-industry liaison that can affect the overall performance of corporate as well as the academic sector in Pakistan. More than ever, the development and quality of life of a nation depend on its cultural and scientific level, itself largely dependent on the value of its higher education (Ivascu, Cirjaliu, & Draghici, 2016). Currently, the changes in the state, its disengagement and encouragement to move into a contracting society open up the possibility of public-private partnerships in the most open areas and the university-business partnership makes it a prototype. Indeed, the changes in higher education place universities and institutions that fall under a strategic position as an actor of economic development (Ashraf et al., 2018). The opening of the university to the socio-economic world is essential to the achievement of all its scientific, educational and cultural objectives. Hence, the collaboration of the Liaison between the world of Industry and Higher Education is necessary (Bstieler, Hemmert, & Barczak, 2015).

The needs and challenges of the Industrial world to obtain quality human resources and the development of quality technology are expected to be answered with good cooperation with partner universities. It has been identified that universities must be more daring to update their curriculum and material following the dynamic technological developments. Universities must also be more aggressive in collaborating with the industrial world; this is because this collaboration is considered as the cornerstone for a healthy and progressive economy. For Maietta (2015), infrastructure and human resources are the main things for this case. But if there are indeed limited funds and insufficient government funding, it might be time to cooperate with industry without reducing the idealism of the parties on campus or industry. Today, in Pakistan, as elsewhere in the world, higher education is confronted with three major shocks: the growth of the demand for knowledge, the diversification of the disciplines to be taught and the increase in the cost of teaching (Afzal et al., 2014). In Pakistan, relations between universities and businesses are far from being as large as they should be, despite the existence of engineering schools and schools of business and management, natural partners of companies; the presence of major public research organizations; and also the reciprocal mistrust that has long prevailed between academics and the business world (Khan, 2019). However, over the past ten years, significant progress has been made, particularly in the professionalization of university courses and, more recently, in university research cooperation with universities through the setting up of incubators (Aijaz, 2018). As for the continuous training of university personnel by universities, it still has weaknesses. Partnership with businesses is of particular importance in the education and research sectors. Indeed, the university-enterprise partnership is part of the university's mission to enable it to be in symbiosis with its economic environment through multiple gateways from university to business and vice versa.

Problem Statement

The distance between universities and industry needs to be eliminated to create an intelligent and successful economy. Collaboration between universities and industry plays an important role in encouraging synergies (Ankrah & Omar, 2015). In this way, the goals of economic development can be achieved. The industry is currently in a new game with the presence of various startups. Although the scale is still small, the startup can set aside several large companies. This happens because they are not just producing products, but can create their trends. Meanwhile, large companies that stick to traditional assumptions eventually only become followers and slowly begin to be abandoned (Ashraf et al., 2018). Also, current technology is developing rapidly and science continues

to develop so that, it becomes clearer the importance of cooperation between universities and industry. Higher education itself becomes a place of various innovations that can be utilized by industry in the future and at the same time, the industry can bring research results to be applied in society (Fischer et al., 2018).

Graduating of students and the needs of this market are not directly connected, because to be able to just pass actually by diligently entering and obeying the rules can be fast. It is different when the vision of graduating from college is by achievement and can later work according to the field of study studied to produce benefits (Alhamrouni et al., 2016). To ensure graduation with good competence, Ivascu, Cirjaliu, & Draghici (2016) emphasized that students must be sociable, creative, and they should not shy about trying new things, including part-time in many places according to the field they are working on. Moreover, Pittayasophon & Intarakumnerd (2017) further added that the industry must be more patient in dealing with the academic environment, likewise, the academic world must be able to respond to the needs of the industrial world. The synergy between the two is needed, although each party pursues a different KPI (Key Performance Index). Academics pursue contribution to knowledge in the form of scientific writing publications, while industry pursues contribution to people in the form of products that are beneficial to society. At present what happens is only limited to practical work and that is also triggered by universities in their curriculum. As stated by Aizpun, Sandino, & Merideno (2015), the university has HR assets, namely students, teachers, and researchers. The industry has assets in the form of cases (real problems) that must be resolved to support its business. This is matching to be linked in a cooperation scheme, for example, the industry provides R&D (Research and Development) funding to universities to solve their problems. Currently, what happens is that most industries only provide "projects" and sometimes there is no R&D. This is the gap.

OBJECTIVES

The main goal of this research is the exploration of the factors and main constraints of academic-industry liaison that have been faced in Pakistan currently. The purpose of this work is to highlight the various forms and benefits of the university-business partnership and the conditions necessary to achieve it. The objective of the present work is, therefore, to raise upstream a reflection to identify the main principles and guidelines to highlight a partnership action mutually beneficial to the university and the company. The promotion of the lines of collaboration between them and the participation in the construction of new spaces of exchange between these two worlds to integrate into parallel a new culture within the student community. Thus, the university is called, once again, to question its relationship with the business world. Following are the proposed objectives of the research:

1. To identify the major characteristics and functions present in the academic-industry liaison in Pakistan.
2. To explore the major factors and constraints present in the academic-industry liaison in Pakistan.
3. To analyze the effects of academic-industry liaison constraints on the sustainability of this linkage in Pakistan.
4. To recommend effective ways to improve the academic-industry liaison in Pakistan.

METHODOLOGY

The research is quantitative and has selected a positivism philosophy and deductive approach, and the novel information has been obtained through the use of a questionnaire, which is based on 5 points Likert Scale. In particular, a total of 500 teachers, students, lecturers, and management persons have been selected for the current investigation, and they have distributed the questionnaire requiring them to select the most appropriate frequency to demonstrate their understanding of the topic. After the distribution of the survey questionnaire, 377 valid responses were collected.

This research on "academic-industry liaison" is a rich and enriching current topic, considering the remarkable evolution of the phenomenon in Pakistan, especially during the last decade, and the multiplicity bridges that are put in place to expand the areas of collaboration between academia and business (Khan, 2019). The university-business partnership is an integral part of the current university's concerns, but despite this, it is still far from being as large as it should be. The rich theme, since between the university and the company, there is always a mutually profitable dynamic of exchanges and it allows a review of the experiences of the pioneer countries in the matter. The current research topic is also enriching since it allows an assessment of the state of the art of the university-enterprise partnership phenomenon and a test of the failures of the adoption of this concept supported by some recommendations via the examination of an arsenal possible reinforcing measures to improve this phenomenon (Aijaz, 2018). Indeed, the choice of this research topic stems from the conviction of the importance of this partnership practice within the academic community and the lack of specialized literature and research that addressed this issue.

LITERATURE REVIEW

Currently, in the trend of international economic integration, the restructuring of the economy has opened up many opportunities for exchanging and transferring labor resources between countries. This is both an opportunity, but also a challenge for universities in training human resources with both professional knowledge and practical

experience to meet the needs. The link between universities and businesses is an important step in the training process of universities, which is the basis for ensuring the quality of human resource training to meet the needs of society (Khorsheed & Al-Fawzan, 2014).

Fundamentals and Characteristics of Academic-Industry Liaison

Collaboration in the world of education and industry is considered important, where the educational program between the three parties focuses a lot on developing research and community service at the tertiary level, to present solutions for the different organizational sectors (Rajalo & Vadi, 2017). According to Scandura (2016), there is a global innovation market, where this is a commodity that can be bought, sold, licensed, lent and reinvested. Within this environment of collaboration with outsiders in the field of innovation, the process of technological transfer arises, through which a public or private organization transmits its knowledge or technology to another for the development of a process, the manufacture of a product or the provision of a service (Berbegal-Mirabent, García, & Ribeiro-Soriano, 2015).

Industry workers are reluctant to include in their schedule anything that is not a production meeting or a meeting that was caused by a production problem (meeting another bank loan). They cannot waste time participating in conferences, congresses, seminars, and similar events. Establishing communication between universities and industrial companies is just one of many things that should improve cooperation (Moilanen, Halla & Alin, 2015). Many small businesses are active in the automation industry, and they cannot finance more expensive projects. There is no pooling mechanism, either based on industry associations or special-purpose consortia that are common abroad. A common approach would also help small businesses access expensive metering instruments for which they do not have the resources and would not fully exploit them. It is also necessary to change the organization of research and pedagogical work at Pakistani universities. In particular, it is important to use project management in research and development work.

Functions and Advantages of Academic-Industry Liaison

Universities always want to train human resources to meet the needs of society, including businesses (Afzal et al., 2014). The needs of the labor market are diverse and volatile. This will greatly impact newly graduated students who want to find a suitable job. Employers always require graduates to have professional qualifications and practical work experience (Arunagiri et al., 2016). This leads to the situation that recent, inexperienced students will not meet the needs of businesses and fall into unemployment. It is not possible to assess the quality of the school's training based on whether or not graduates can find jobs, because the university has a reputation and prospects, but still cannot avoid the situation of many unemployed students (Cheng et al., 2018). Thus, the problem is that training institutions need to grasp the needs of the job recruitment market where businesses themselves are the information bridge, providing schools with market demand and need. Through several types of research, it shows that over 80% of businesses are interested in building skills for students during internships in enterprises, about 30% -35% of businesses recruit medium students to graduate and only about 4% of businesses cooperate with the school in teaching and scientific research. The joint training between universities and businesses is the link that comes from the interests of both sides. In this way, the new schools can orient the training method to be suitable and meet practical requirements (Wickramasinghe & Malik, 2016). On the business side, to develop the business, you need to have a quality workforce first. Finding a quality team is an important issue for businesses. If universities can provide businesses with the right training products for businesses, the most ideal for businesses (Tran, 2016). Therefore, the link between universities and businesses is indispensable, bringing benefits to both schools and businesses.

Challenges of Academic-Industry Liaison

Looking back on the reality of higher education in Pakistan today, it can be seen that, in the traditional training model, students are the final product of the training process (Aijaz, 2018). Although there are interactions between lecturers and employers, between learning and working environment, the cohesion between schools and businesses is not much. The main reason is due to the separation of time and space, that is, when students graduate, the school can test the ability to meet the needs of businesses (Khan, 2019). Universities have introduced many training methods that link between schools and businesses. It is not a matter of communication but of lamentation within both groups whose representatives do not listen to each other. Each side cares selfishly only about its problems and needs. University staff stresses that they need a lot of money for their research. They set the focus of their research and believe that what they are researching will need industry. On the other hand, representatives of an industrial enterprise often require the university to solve their tasks as soon as possible. Indeed, many industry workers feel that schools receive research funding from the state budget, where the company pays considerable money through taxes, so they are entitled to the results of research at state universities, free of charge.

Most universities in the country today do not have sufficient information on labor demand; on the other hand, the technological transformation of enterprises is continuous so the association of training with use must also

change if you do not want to become obsolete (Fischer et al., 2018). Currently, the concept of good stops at the level of good study, a good exam, and not good work. The spirit of learning and practicing has not yet had a firm foothold in the school, so the training is far from (or not keeping up with) the requirements of reality. So to avoid the backwardness of scientific knowledge, technology, the motto of the school in the current period also needs to change. Businesses can participate in supporting the school to recruit students directly to meet the specific needs of the business or by providing scholarships to support potential students.

Effects of Academic-Industry Liaison Constraints on the Sustainability of this Linkage

Modern and practical education is understood as education that always meets the requirements and requirements of practice, to form and develop the practical capacity for learners. Collaborative relationships between schools and businesses are all forms of direct or indirect interaction, of a personal or organizational nature, between universities and businesses to support each other because benefits of both: Cooperation in research and development, stimulating the dynamic movement of lecturers, students, and professionals working in businesses; commercialization of research results; construction training program; organize lifelong learning; support creative and organizational governance efforts.

The partnership between university and business is dialectical, for the benefit of both sides. The joint training between the school and the enterprise is the cooperation between the school and the business party to implement the goals, training programs and development strategies set up by the two sides. In training links between the school and businesses, the school plays the role of the main unit responsible for training (implementing the content, processes, quality of training, granting diplomas and certificates to people who are educated); and enterprises play the role of coordinating units (orientation, funding, facilities, organization, management, reception and use of training products). From this link, universities have more conditions to improve the quality of training, giving the products that have been experienced in practice. On the business side, it will take advantage of high quality and stable human resources (Soendergaard, Bergenholtz & Juhl, 2015). Cooperation between universities and businesses will guide universities to bring to society the products associated with practical requirements, meeting the needs of the labor market, helping businesses improve the quality of human resources and force, create a competitive advantage in the market. The partnership between schools and businesses is very important in shortening the distance from the lecture hall to practice (Arunagiri et al., 2016).

The link between universities and businesses is an indispensable trend in the socio-economic development of all countries. The width and depth of this link depend heavily on the direction of the authorities, the choice of methods as well as the compromise of the entities. The effectiveness of the linkage is always to improve the stature, to strengthen beliefs as well as to increase the level of positive influence on the social life of the involved parties. Collaborative relations between schools and businesses are all forms of direct or indirect interaction, of a personal or organizational nature between universities and businesses to support each other for the benefit.

QUANTITATIVE ANALYSIS AND FINDINGS

Demographics

The demographics section of the thesis comprises of the gender, age and occupation statistics of the respondents involved in the survey process. Each demographic variable is aimed towards the identification of the number of respondents and their respective gender, age and occupation.

Gender

From the gender statistics and figure mentioned below, it can be observed that out of 377 respondents, 239 of them were males while 138 of them were females. This implies that 63.4% of the overall sample size was male whereas 36.6% of the respondents were females.

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	239	63.4	63.4	63.4
	Female	138	36.6	36.6	100.0
	Total	377	100.0	100.0	

Gender
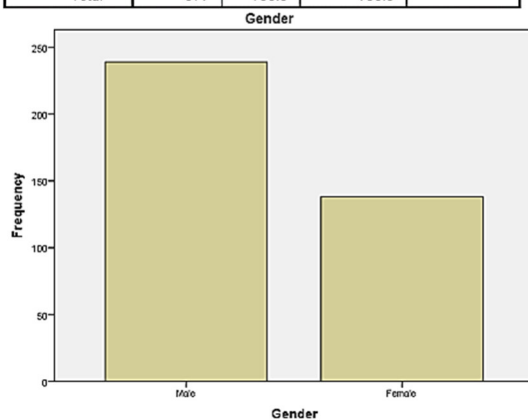
Age

From the age statistics and figure mentioned below, it can be observed that out of 377 respondents, 46 of them belonged to the age group of 15 – 20 years, 32 of them belonged to the age group of 21 – 25 years, 36 of them belonged to the age group of 26 – 30 years, 24 of them belonged to the age group of 31 – 35 years and 89 of them belonged were above 41 years. This implies that the majority of the respondents of the given survey were above 30 years.

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-20	46	12.2	12.2	12.2
	21-25	32	8.5	8.5	20.7
	26-30	36	9.5	9.5	30.2
	31-35	24	6.4	6.4	36.6
	36-40	89	23.6	23.6	60.2
	41 and above	150	39.8	39.8	100.0
	Total	377	100.0	100.0	

Age
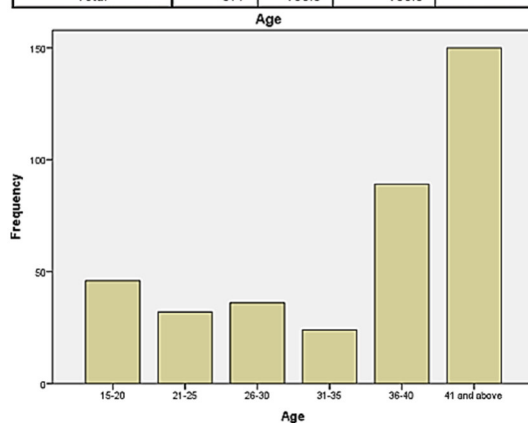
Occupation

From the occupation statistics and figure mentioned below, it can be observed that out of 377 respondents, 50 of them were lectures, 81 of them were professors, 88 of them were teachers, 32 of them were students and 126 of the respondents were people belonging to the managerial positions in various industries. In total, 126 of the respondents belonged to the industry whereas 251 of the respondents belonged to different universities.

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lecturer	50	13.3	13.3	13.3
	Professor	81	21.5	21.5	34.7
	Teacher	88	23.3	23.3	58.1
	Student	32	8.5	8.5	66.6
	Management	126	33.4	33.4	100.0
	Total	377	100.0	100.0	

Occupation

Descriptive Analysis

The key to conducting this analysis is to have a bigger picture of the responses obtained via the survey. From the figure attached below, it can be observed that the mean value for the constraints variable in the current data is found out to be 3.4841. Since the survey questionnaire was developed based on the Likert scale and the 3 value represents the Neutral Option, hence it can be said that the majority of the responses for this variable lie near the neutral option. Similarly, the mean value for the sustainability of the linkage variable in the current data is found out to be 3.4968. Hence, it can be said that all the data for this variable and the responses are also near to the neutral option.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Constraints of academic-industry liaison	377	1.90	4.80	3.4841	.58973
Sustainability of the linkage	377	1.60	4.90	3.4968	.67303
Valid N (listwise)	377				

Reliability Statistics

Reliability Analysis is a statistical tool that is used for the sake of identifying the consistency of the survey questions formed in the questionnaire. Cronbach's Alpha coefficient is generated while applying the reliability statistical tool. According to Bonett & Wright (2015), to depict the high reliability and consistency of the survey questions, the coefficient value of Cronbach's Alpha should be closer to 1 (i.e. 100%). From the image attached below, it can be easy to interpret that the questions mentioned in the survey questionnaire are highly reliable. This is because the coefficient value is observed to be 0.844. Hence, it can be said that there is a high or 84.4% reliability of the survey questionnaire developed for this specific research.

Reliability Statistics

Cronbach's Alpha	N of Items
.844	20

Correlation Analysis

Cohen, West & Aiken (2014) explained that the correlation analysis is a statistical measure that is used to determine the linkage or the relationship between the two variables under study. Pearson correlation coefficient is generally used to analyses the relationship between the independent variable and the dependent variable. In this research, constraints of academic-industry liaison are the independent variable, whereas the sustainability of the U-I linkage is the dependent variable.

The image attached below represents the correlation statistics for the current research. The sig value for the current research has found out to be 0.000 that is significantly less than the standard value (0.05). This shows that there is a relationship between the two variables. The Pearson correlation value reveals the intensity of the relationship and it is identified to be 0.873 or 87.3. As per the standards, the Pearson Correlation should be closer to 1 or 100% to show a strong correlation between the variables. For the given research, variables of constraints

of academic-industry liaison and sustainability of the U-I link is strongly and positively correlated to each other. This is because the strong and positive correlation can be seen if the constraints of academic-industry liaison have a coefficient value that is closer to 1 or 100% (i.e. 87.3%).

Correlations

		Constraints of academic-industry liaison	Sustainability of the linkage
Constraints of academic-industry liaison	Pearson Correlation	1	.873**
	Sig. (2-tailed)		.000
	N	377	377
Sustainability of the linkage	Pearson Correlation	.873**	1
	Sig. (2-tailed)	.000	
	N	377	377

**. Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis

The regression analysis is the tool that is used to analyze the impact of one variable onto the other. The regression test here is applied to analyze the impact of the constraints of the academic-industry liaison on the sustainability of the U-I linkage. Three tables are generated where regression tests are applied through SPSS software. The model summary table obtained through regression analysis reveals describes the dependency of each variable on the other whereas the R-value of the table is used to determine it. Since the R-value for this research is found out to be 0.873 or 87.3%, this depicts that the dependency level between the constraints of the academic-liaison and the sustainability is very strong.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.873a	.762	.762	.32862

a. Predictors: (Constant), Constraints of academic-industry liaison

Another table that is yielded from the regression analysis is the table of ANOVA which shows the model fitness. From the sig value mentioned in the table, it can be said that the regression line for this study is perfectly fit and there are no outliers in the data responses.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	129.819	1	129.819	1202.112	.000b
	Residual	40.497	375	.108		
	Total	170.316	376			

a. Dependent Variable: Sustainability of the linkage

b. Predictors: (Constant), Constraints of academic-industry liaison

Another table that is yielded from the regression analysis is the table of coefficients where the sig value depicts the impact of one variable on the other. Since the sig value for this study has found out to be less than 0.05, hence it can be said that the alternative hypothesis of the study has been accepted while the null hypothesis is rejected. Conclusively, it can be said that the regression analysis performed in this study shows that there is a significant impact of constraints of the academic-liaison on the sustainability of the U-I linkage.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.025	.102		.250	.803
	Constraints of academic-industry liaison	.996	.029	.873	34.671	.000

a. Dependent Variable: Sustainability of the linkage

Summarized Findings

In industry-academia collaboration, it is very important to clarify what is first aimed as a starting point and to find a partner who can deal with it and build relationships. Besides, it is necessary to clear the problems and issues to be solved in the efforts and to ensure the response. In that case, it is necessary to establish a clear give-and-take relationship, respect the other party's position, and deepen understanding while clarifying the scope of responsibility and the division of roles on the premise of the difference in position and way of thinking between universities and companies (Huang & Chen, 2017). To that end, proximity to the geographical distance and ease of travel should be emphasized. On top of that, scientific knowledge and specialized human resources such as universities, advanced research system, educational ability, etc. are positioned as a part of external knowledge, and using them can improve the problem-solving ability, and also provide human resources who can bear the future It is necessary to steadily accumulate the steps to nurture and create a creative new business.

CONTRIBUTION

In this current research, the researcher kept in mind that the survey participants should provide honest responses. For this purpose, each research participant sent the informed consent form which reveals that their participation in

the research work is completely voluntary and no research ethics were violated or caused any harm to the survey participants. Moreover, the anonymity of survey participants is also ensured. Participants were informed that their personal information is not used inside or outside the research work. Similarly, another ethical point to conduct the research is to provide credentials to the authors whose work has been incorporated into the research work (Ali, 2015). For this purpose, the researcher ensured that the material included in the research is plagiarism-free. This is also done to maintain the university standards of academic research.

RECOMMENDATIONS

The organizations of Pakistan, on the one hand, should help universities to take advantage of enterprises' opinions that contribute to the school on training programs, learning outcomes, practice, internships as well as vocational skills training. On the other hand, many problems of the economy and the business community should also be discussed by the scientists in the school, offering solutions as a reference for businesses in the process. For effective research projects to be accepted by enterprises, first of all, it is necessary to further expand the scientific research movement in depth. To do so, both motivating and forcing lecturers to participate in scientific research activities must be created at the same time. Secondly, before approving an applied research project, the school should request materials to assess market demand for technology, either authored or ordered by an independent market research agency. Thirdly, invite reputable business managers to participate in the council of acceptance of scientific research topics in related fields for enhancing the participation of businesses in the process of evaluating applied research results. Lastly, schools and faculties should have plans to strengthen the network of alumni, especially business alumni. This is considered a bridge between schools and businesses in strengthening cooperation between schools and businesses in general and scientific and technological cooperation in particular.

LIMITATIONS

The first limitation of the study is in the form of its design; more specifically, the study has only preferred quantitative research design, which means that the participants and their responses have been restricted in the form of frequencies and that they cannot offer any valuable insights into the impact of academic-industry liaison constraints on the sustainability of this linkage. This means that the selection of quantitative research design is the foremost limitation of the current investigation.

CONCLUSION

The cooperation of universities with different institutions is increasing day by day. Firstly, the school has to cooperate with Pakistani Business Associations to organize a contest of 'Creative Ideas'. This could be an annual activity, which should be held for many years. The competition will aim to find practical and creative ideas and innovations that can be applied in practice while promoting the ability to think, to create new ideas, and to create opportunities for science and healthy intelligence. This will be useful for all teachers, students and office workers in businesses. Thereby, this results in promoting the movement of learning and scientific research participation of teachers, students and staff in schools and businesses in Pakistan.

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