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Explanatory Analysis Of Gomal University Contributions To Research Innovation And Commercialization

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Abstract

Higher education institutions are assigned to carry on research innovation practices and expedite commercialization process of its products as part of their mission. This advancement provides new insight to universities in contributing to the commercialization of university knowledge in the literature. The study investigated Gomal University's contribution to research innovation and commercialization. The explanatory design was used to collect quantitative data from supervisors and scholars and qualitative data from directors of ORIC, GSR, and QEC, faculty deans, and heads of departments. Simple random and purposive sampling techniques were used for sample selection. Descriptive and thematic analysis was done to determine the results of the study. The study concluded that Gomal University is not contributing like other universities which are doing practices in research innovation. The innovation status is in the initial stage; the university is trying to build relations with industries, government, foreign universities, and research funding agencies to boost the innovation culture per standards of excellence. Similarly, stakeholders believe commercialization is weak and needs to be strengthened further in the university. It is recommended that the vice-chancellor, faculty deans, and heads of departments sit down to ponder and review the innovation and commercialization process, especially in the agriculture and pharmacy faculties of the university.

Keywords: Explanatory, Innovation, Commercialization, and Gomal University

Introduction

Higher education institutions (HEI) strategically enhance entrepreneurship, economics, innovation, commercialization, and structural change. The country's economy is highly dependent on higher education institutions' performance in research innovation and commercialization. The 21st is one of the challenging centuries that demands to contribute efforts in innovation and entrepreneurship for sustainable growth and development. (Perkmann & Walsh, 2007; Ankrah & Al-Tabbaa, 2016).

Through university-industry partnerships (UIPs), university-centered clusters, and university-industry research centers, universities make significant contributions to the technical development and innovation of the companies with whom they work. Additionally, through knowledge spillover loops, these collaborations often have an effect well beyond the initial academic and company partners group.

In recent years, more and more academics have taken an active role in the commercialization of their research by founding companies or patenting/licensing technological solutions and

technology platforms. The value of academic entrepreneurship to the economy is still up for debate. The scientific literature from various countries and places suggests that ASOs' direct impacts are quite minor. However, even with unsuccessful ASOs, or academic patenting, there are broader effects. A growing body of evidence suggests that even unsuccessful spin-offs can serve as a vehicle for sharing and capitalizing on knowledge that can help other startups grow, existing businesses thrive, and enable actors and industries to build their expertise.

Graduates from colleges and universities have great potential to spur innovation and entrepreneurship, either by starting their own businesses or by working for established ones. Universities have a responsibility that is just now being fully recognized: preparing students for employment in increasingly innovative working contexts and helping them develop skills strengthening their entrepreneurial and intrapreneurial capacities.

The full-fledged ORIC was established in 2014 in Gomal University, keeping in view the direction of the Higher Education Commission of Pakistan. The office aimed at liking and commercializing the research activities with emerging firms across the country and worldwide. ORIC will create a Business/Technology Incubator to foster innovation and entrepreneurship through the organization's own internal mechanisms for research commercialization. In September of 2014, Gomal University established the groundwork for what is now known as ORIC. Since the organization's founding, ORIC's operations have always been conducted under HEC standards. The mission of the ORIC is to ensure that the university's researchers have the resources and opportunities they need to produce high-quality research. The 2019 Annual Report of Gomal University includes a summary of this office's accomplishments. There were ten (10) research projects in the National Research Program for Universities (NRPU) in the fields of pharmacy, biotechnology, and agriculture; two (2) thematic research grants; one (1) grant from a non-governmental organization; and one (1) grant from the Foundation Plants for Health; and thirteen (13) startup research grants earned by faculty members in 2018–19; not to mention numerous startup research grants by newly appointed Ph.D. faculty members serving as Intern Placement for Foreign Students (IPFP). Some of the accomplishments of the Gomal University ORIC under the direction of Prof. Dr. Muhammad Niamat Ullah Babar ((http://nematagriculture.yolasite.com).

Dalmarco, Hulsink, and Blois (2018) revealed that all public and private sector universities are emphasized by organizing all research activities through ORIC in order to commercialize and innovate the research and other activities that are helpful in the progress of HEIs. Rao (2019) asserted that the linkage between industries and universities is vital for promoting and strengthening higher institutions or universities. The key purpose of the entrepreneurial institutions is to facilitate the disciples and other interested faculty members, scientists, and scholars with practical, innovative knowledge so that economic progress may occur. High Education Commission (2018) found that the ORIC in each university should be properly functioning in a true spirit to ensure quality research programs by giving positive and supportive feedback to faculty and students in research perspectives, to practically implement research for economic enhancement and progress of the country.

Niccum et al. (2017) stated that the first and foremost priority of HEIs is to facilitate and motivate HIEs for their economic stability and other developmental activities. Other technological resources may be utilized properly through talented pupils, faculty members, researchers, philosophes, and scientists. Ashwin (2012) and Altbach (2013) described that the ORIC office in each university plays an effective role in taking commercial and innovative steps for every

department in the university, including different sectors like the finance section, QEC section, Academic section, sports and university-industry association for economic purposes and development along with research linkage with abroad or foreign countries, etc. Baron (2017) and RehUllah and Dost (2017) illustrated that any university/higher education institution could make international fame via well-established ORIC and QEC offices and sections. Commercial, innovative, and industrial linkage can be successfully promoted with the help of the QEC and ORIC in the university in a true spirit.

Bastalich (2010); and Ravi and Janodia (2021) said that technological commercialization, curriculum development, research-based progress, and other mandatory developmental pieces of training in all universities/HEIs are easily achieved through ORIC or QEC sections. HEC, Pakistan, issued a policy in 2010 advising all universities to establish ORIC that is fully functional for everyone in the university. Bracio and Szarucki (2019); and Wathanakom, Khlaisang, and Songkram (2020) demonstrated that entrepreneurship along with technological transformation, commercialization, and innovation are all satisfactorily supported and promoted by the ORIC office, including multi-disciplinary initiatives pertaining to research so that quality education may be ensured and maintained.

Das (2020) and Issa and Tesfaye (2020) highlighted that all research grant opportunities and financial assistance are provided by ORIC and QEC sections which innovation in all activities may ensure. Academic-industry coordination and cooperation are very important for the country's economic development. Hülsbeck, Lehmann, and Starnecker (2013); and Jung and Horta (2013) asserted that without a well-established ORIC and QEC section, no university or HEI could claim its' innovation, commercialization, and economic stability at all. Muborakshoeva (2015) pointed out that the progressive steps for the betterment of university, economy, science, industrial relation, innovation, and commercialization are possible merely with the help of ORIC.

Objectives

To know the status of research innovation at Gomal University.

To see the status of research commercialization at Gomal University.

Research Questions

What is the status of research innovation at Gomal University?

What is the status of research commercialization at Gomal University?

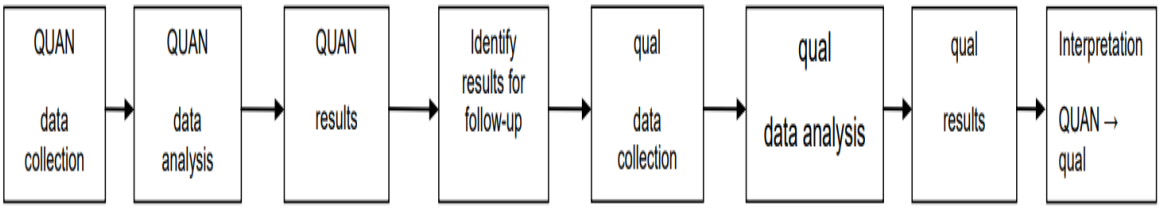
Research Methodology

Mixed-method research is used in numerous fields of social sciences such as psychology, political science, physical education and sports, education, and public health (Creswell et al., 2009). It enables researchers to use both the research approaches, i.e., quantitative and qualitative, and reach to depth conclusion of the study. The study aimed at "Explanatory Analysis of Gomal University Contributes to Research Innovation and Commercialization." Therefore, the researcher used a mixed-method (explanatory sequential design) to conclude the study results efficiently. The central part of this study was quantitative; therefore, in this phase researcher used a valid and reliable questionnaire to obtain data from stakeholders of Gomal University. The qualitative part was also important not only to interview in-depth but also to evaluate and verify the results of quantitative data. The population of the quantitative phase consisted of 130 supervisors and 1202 M.Phil. and Ph.D. scholars.

In contrast, the qualitative population comprised 42 stakeholders, including heads of departments, faculty deans, ORIC, QEC, and GSR directors. The researcher took 98 supervisors and 202 scholars as a quantitative phase sample using the Raosoft (2020) online

sample size calculator. Similarly, the research interviewed 15 respondents, including three ORIC, QEC, and GSR directors, five faculty deans, and seven heads of departments. According to Emmel (2015), 12 participants are sufficient for the generalizability of the results. The research used simple random and purposive sampling techniques for sample selection. The researcher personally gathered the primary data by using a valid research instrument and semi-structured interview protocol. The researcher administered 390 questionnaires to research supervisors and scholars, whereas 373 received filled-in questionnaires duly. The researcher analyzed the quantitative collected data by using descriptive and inferential statistics. Similarly, the researcher did a thematic analysis covering the study's qualitative portion.

Figure 1 Mixed Method (Explanatory Sequential Model) Creswell and Plano (2007)



Results

Table 1 shows the interest of research supervisors and scholars in innovative research practices in vogue at Gomal University. The cumulative percentage and mean of all the statements were intended. The scale-wise average percentages and means of all the items were also measured. The average percentage of strongly disagree, disagree, uncertain, agree, and strongly agree were 34.3, 18.8, 3.5, 28.7, and 14.7, respectively. Similarly, the average mean of all the items was 2.87, which indicates both supervisors and scholars believed that innovative practices were moderately in vogue at the University. The figure also presents the graphical view of the analysis.

Table 2 shows the interest of research supervisors and scholars in research commercialization practices in vogue at Gomal University. The cumulative percentage and mean of all the statements were intended. The scale-wise average percentages and means of all the items were also measured. The average percentage of strongly disagree, disagree, uncertain, agree, and strongly agree were 48.6, 14.1, 3.6, 22.7, and 11.0, respectively. Similarly, the average mean of all the items was 2.3, which indicates both supervisors and scholars believed that commercialization practices were not in vogue up to the mark at the University. The figure also presents the graphical view of the analysis.

Table 1 Research Innovation Practices as Perceived by Research Supervisors and Scholars.

Statements	SDA %	DA %	U %	A %	SA %	Mean
University introduces innovative practices to boost research culture.	34.3	18.8	3.5	28.7	14.7	2.71
Offices work best in research entrepreneurship.	16.6	24.4	4.8	36.5	17.7	3.14
ORIC promotes academics.	21.7	24.4	4.3	32.2	17.4	2.99
University assists quality research activities.	26.0	24.1	8.0	30.3	11.5	2.77
Research offices ensure quality science laboratories.	15.3	29.2	3.5	34.0	18.0	3.10

ORIC plays a vital role in the advancement of laboratories.	25.5	12.1	1.6	42.1	18.8	3.17
Research offices expedite the process of innovative activities.	26.8	13.7	6.2	42.4	11.0	2.97
Offices secure funds for innovative practices.	24.7	20.4	4.8	33.2	16.9	2.96
ORIC secures developmental funds.	26.3	22.3	3.2	30.6	17.7	2.91
Offices timely strengthen the university economy.	28.4	20.9	2.1	32.7	15.8	2.87
Research offices ensure policies and priorities for research innovation.	31.1	22.8	7.5	26.3	12.3	2.66
ORIC timely communicate to the government and other centers for innovation.	35.9	20.6	4.0	25.7	13.7	2.61
University plays a vital role in technological innovation.	29.5	22.5	4.0	30.3	13.7	2.76
University tries to maintain the best financial standard.	41.6	10.2	4.8	24.7	18.8	2.69
Average	**34.3**	**18.8**	**3.5**	**28.7**	**14.7**	**2.87**

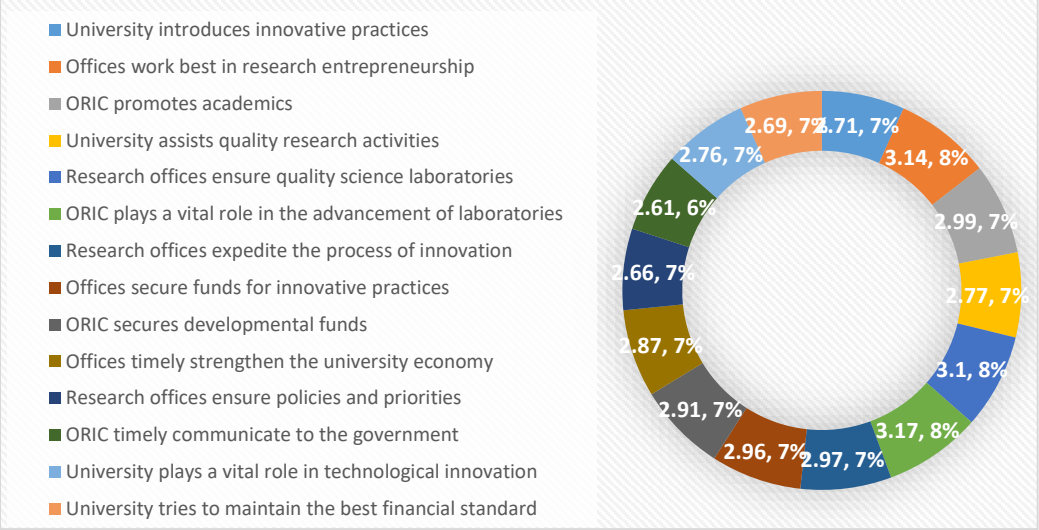


Table 2 Research Commercialization Practices as Perceived by Research Supervisors and Scholars.

Statements	SDA %	DA %	U %	A %	SA %	Mean
ORIC shows a positive attitude toward research commercialization.	47.5	12.1	2.4	26.5	11.5	2.43
University correctly links with industries for commercialization.	50.1	18.2	4.0	19.6	8.0	2.17
University appropriately communicates to the marketplace.	41.6	22.8	4.0	21.7	9.9	2.36
University builds positive relations with research agencies and offices for better commercialization.	50.9	3.5	4.3	28.4	12.9	2.49
University timely communicates with industries for quality products.	48.3	17.4	4.6	19.0	10.7	2.27

University uses media for research work commercialization.	47.7	9.4	2.4	25.7	14.7	2.50
University assists marketable-based research.	53.9	15.3	3.5	18.2	9.1	2.13
Average	**48.6**	**14.1**	**3.6**	**22.7**	**11.0**	**2.3**

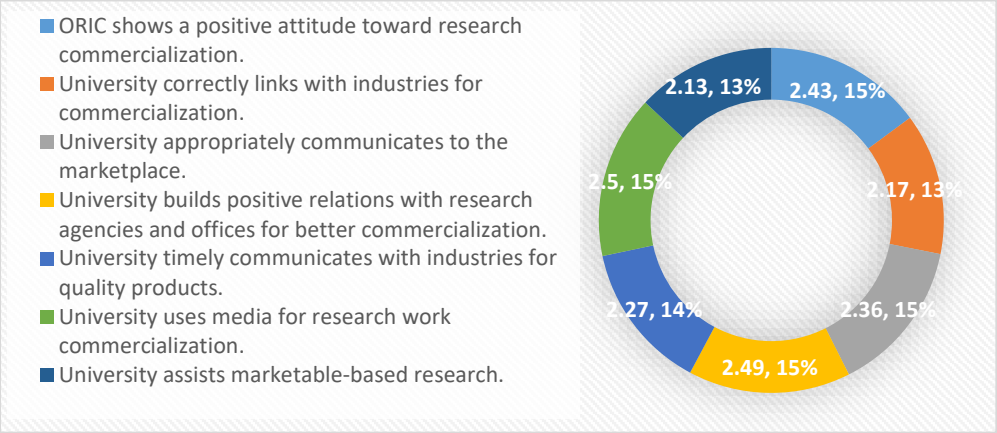


Table 3 presents the main themes generated from the data collected from ORIC, QEC, and GSR directors, five faculty deans, and seven heads of departments. The analysis shows that 87% of administrators believed the contribution of Gomal University in research innovation is in progress; similarly, 73% agreed innovation status is not up to the mark due to lack of funds. 93% of administrators believed that there is less contribution of Gomal University in research commercialization. 86% believed commercialization status is weak due to a lack of interaction with industries and other funding agencies.

Table 3 Qualitative themes generate from the data about research innovation and commercialization.

Research Innovation			
S.#	Main Themes	Frequency	Percentage
1	In progress/Initial Stage	13	87%
2	Lack of Fund/Economy	11	73%
Research Commercialization			
1	Weak	14	93%
2	Poor Relations with industries	13	86%

Discussion

The country's economy is highly dependent on higher education institutions' performance in research innovation and commercialization. The 21st is one of the challenging centuries that demands to contribute efforts in innovation and entrepreneurship for sustainable growth and development. The valuable contributions of higher education institutions in research innovation lead to the successful economic growth of the country. Various studies concluded that several countries around the globe have challenges in innovation and commercialization. The present study conducted to see the contribution of Gomal University to research innovation and commercialization. The study concluded that Gomal University is not contributing like other universities done practices in research

innovation. The innovation status is in the initial stage; the university is trying to build relations with industries, government, foreign universities, and research funding agencies to boost the innovation culture per standards of excellence. Similarly, stakeholders believed that less practices are in vogue for research commercialization in the university. According to Zafar (2015), the actual status of commercialization cannot be tackled without tremendous interaction between industries and higher education institutions. Such interaction leads to product production and the act of commercializing. Ritu (2007) concludes that monetarily incentivizing government institutions brings positive change in research innovation and commercialization. Bhutto and Lohana (2018) found poor status of innovation and commercialization in Sindh universities due to a lack of University, Industries, and Government (UIG) linkages. Power and Malmerg (2008) concluded that no clear role was found in how universities contribute to the regional innovation system. Caniels and Van den Bosch (2011) reported that higher education institutions' role in regional innovation has generally been under investigation. Smith and Bgchi-Sen (2012) concluded that a positive association between the university and the local high technology economy leads to broader innovation and commercialization trends and assists universities in designing national funding programs. According to Altaf, Hussain, and Batool (2019), establishing the Office of Research Innovation and Commercialization (ORIC) is important as it expedites the triple helix culture process in the country, and universities take a keen interest in innovation and entrepreneurship. They also highlighted that several universities in the country are waiting for valuable funds allocated by HEC and other funding agencies for innovative practices.

Conclusion

It concluded that all the stakeholders, including research supervisors, scholars, directors, deans, and heads of departments, believed that Gomal University is not contributing like other universities done practices in research innovation. The innovation status is in the initial stage; the university is trying to build relations with industries, government, foreign universities, and research funding agencies to boost the innovation culture per standards of excellence. Similarly, stakeholders believed that less practices are in vogue for research commercialization in the university. The commercialization status is weak due to a lack of funds for research activities, financial crises, lack of relations with industries, and lack of innovative work, especially in faculties of agriculture, pharmacy, engineering, and natural sciences. It is recommended that the vice-chancellor, faculty deans, and heads of departments sit down to ponder and review the innovation and commercialization process, especially in agriculture and pharmacy faculties involving government personnel, funding agencies, and other universities, so that this meet-up assists these faculties to ponder and prepare patents in order to promote an innovative culture and commercialize the work to the marketplace.

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Highlights:

- Gomal University is trying to build a strong connection with industries to promote innovation.
- Research commercialization is weak and needs further advancement in the university.
- The study's results suggested that a university can improve the process of innovation and commercialization through better coordination and communication with industries and funding agencies.
- ORIC office can get actual status by promoting triple helix culture in the university.
- University can significantly contribute to research innovation and commercialization through the conception of patents.