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Research Article

Adoption of Research Based Practices in Business Institutions: A Cluster Analysis

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Abstract

Background and Objective: Research is the basic component that facilitates the creation of new knowledge, emergence of new ideas and experimentation of new tools, techniques and methods. Pakistan's Higher education institutions are continuously struggling to improve their research capacities to compete globally. The objective of this study is to explore the research related practices, adopted by various business institutions globally and find the adoption of these practices in the 5 business institutions in Sindh through structured questionnaire using five point Likert scale. **Materials and Methods:** Based on similarity of the practices, groups are formed known as criteria and the homogeneity and the heterogeneity of research base practices are analyzed through cluster analysis. Literature reveals various practices to explore this research. This paper selects fifty practices adopted by various business institutions in Sindh. The adaptability of research based practices is analysed through frequency tables. **Results:** Finding reveals that based on similarity these fifty practices are grouped into nine criteria: Registered patents, University industrial linkages, research grants, travel grants, publication and published papers, PhD output, H-Index, conferences and internet bandwidth (PERN) utilization which has high association with HEC. Frequency tables show that patent and university industrial linkages criteria related practices are very less adopted in the business institutions however practices in respect to conferences, publication, internet bandwidth (PERN) utilization and PhD output are more adopted. **Conclusion:** Dendrogram shows that three cluster are individually developed in patent, university industry linkages, travel grant, PhD output and two clusters are individually developed in research grants, publication and published journals, H-Index, internet bandwidth (PERN) utilization and conferences. These clusters are similar with themselves and different from others.

Key words: Adoption, Research based practices, cluster analysis

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INTRODUCTION

Higher education performs a significant role to develop the nation¹. Universities was more conscious in terms of research and faculty member and evidenced about their expertise and their potentials through research productivity². Research was an inspired work that increase knowledge of man, culture and society³. Literature suggests various practices that was adopted by various business schools globally to upgrade themselves. These includes: Clear goals for coordination, research emphasis, distinctive culture, positive group climate, decentralized organization, participative governance, frequent communication, resources (particularly human resources), group age, size and diversity, appropriate rewards, recruitment emphasis and leadership with both research skill and management practices⁴. This paper explores various research practices contributions forward promotion of research culture including: Appointment of faculty members based on their research qualification, maximization of the research capacity through short courses, trainings, workshops and seminars and division of Monetary benefits to those who conduct voluntary research².

The output of the productive research was a copyright and patent, well established institutes have technology transfer offices and incubators that develop research reforms through commercialization of their research inventions⁵. University and Industry bonding was an important factor that facilitates both university and industry to promote the research environment. Universities introduce "Liaison Industrialist Programs" that create opportunities to employees of companies as well as universities to visualize state-of-the-art in the investigation, to visit companies and campuses, to combine work in joint projects, to solve industrial problems through research and to offer joint publication⁶.

Publication of research papers was a core component of the research "Publication" is a practical implication in legal contexts. In the United States, publication is defined as: the distribution of copies of a work to the public by sale or other transfer of ownership, or by rental, lease, or lending (Wikipedia). Literature suggest that post graduate students was forced to publish at least one research paper before degree submission. The university should provide rewards to publish a paper in well reputed research journal such as: Sufficient amount should pay to the author for each paper published in any of the reputed International Journals⁴.

In 2015 ranking HEC suggested on lines of international literature, nineteen criteria to measure the research quality in higher education institutions in Pakistan. The suggested criteria was "Number of registered Patents national level";

"Number of registered Patents at international level"; "Commercialization of registered Patents"; "Number of university industrial linkages"; "Ratio of active PhD students to total active enrolled students"; "Amount of external research grants"; "number of travel grants won for presentation of papers abroad per full time faculty"; "total number of papers published in impact factor journals (ISI web of sciences) and HEC recognized journals (X and Y category journals)"; "Publications in ISI impact factor Journals"; "Citations per paper for total number of ISI impact factor papers"; "University H Index" ; "Number of W category Journals Published by the HEIs"; "Number of X category Journals Published by the HEIs"; "internet bandwidth utilization"; "Digital Library utilization"; "Number of international conferences"; "Number of national professional conferences and total PhD output"⁷.

Cluster analysis was a technique which is use to sort the items per same group within a data set⁶. Cluster analysis identifies the homogeneity of similar groups and develop clusters per similarity Cluster analysis was a type of data reduction technique. Data reduction analyses which also include factor analysis and discriminant analysis, essentially to reduce data. Cluster analysis was unique because its goal is to reduce the number of cases or observations by classifying them into homogeneous clusters⁸.

MATERIALS AND METHODS

In this study sample is collected from five business institutions in Sindh. Data was collected from the director of quality enhancement cells of the institutes. Only qualitative methodology was used for this research. Primary data was collected through structured interviews from five business institutions in Sindh. Five point Likert scale (never, rarely, moderately, mostly, completely) was used to measure the adoption of research based practices. Data was analyzed through frequency tables and cluster analysis using dendrogram through SPSS. Data was analyzing through three stages. At first stage fifty evaluated research based practices are sorted into groups called criteria per them resembles. At the second stage the adoption of research based practices was analyzed through frequency tables and at last stage cluster analysis runs on the adaptability of practices that develop clusters per the nature of adaptability.

RESULTS

Table 1 shows that there was overall fifty research based practices evaluated from literature and based on them resembles all these practices was sorted into various groups

Table 1: Sorting of fifty evaluated research based practices into relevant criteria

Registered patents	
Patent_1	Faculty members are encouraged to file for patents.
Patent_2	Institute have branched to become innovation merchants to other organization (they generate knowledge) to (they license their knowledge to other organizations).
Patent_3	Faculty members are encouraged to commercialize their research work.
Patent_4	Incentives are provided to disclose inventions like royalty sharing agreements or equity participation in academic start-ups.
Patent_5	Young researcher's prizes are offered for inventions that are commercialized.
Patent_6	On-campus or off-campus "technology transfer offices" (TTOs) works to intermediaries to bridge the gap between invention and commercialization.
Patent_7	Small amount of (formal) academic patenting activity that takes place, the increased focus on patenting academic inventions and licensing.
Patent_8	Management take decisions based on discoveries that define scientific research.
Patent_9	Faculty are under intense pressure to publish their research work or file patenting decided by management.
Patent_10	Caretakers financially facilitated to file national or foreign patent.
Patent_11	Inventor is permitted to licensed sponsorship in case of limited patent budget.
Patent_12	Invention can be basis on the new product according to market need.
UIL	
UIL_1	University Industrial Linkages
UIL_2	Programs established to support the University-Industry collaboration like the "Liaison Industrialist Programs".
UIL_3	Institute promote the support of companies to participate in projects of the faculties.
UIL_4	Technology transfer mechanism is actively performing various activities through licensing, arrangements consulting, joint or contract R and D and technical services.
UIL_5	Top management and representatives from all the stake-holders with the roles for industry, universities and government clearly defined.
UIL_6	Persons assigned to manage the linkage programs, either in universities or the public sector must have some experience with industry as well as a flair for dealing with the private sector.
UIL_7	Linkage programs that are developed is based on entrepreneurial foundations, both of university staff and of private industry, with a well-thought-out development plan.
UIL_8	Growing interest in the creation and support of university-related Science Parks and Business Incubators in recent years.
Research grants	
RESEARCH GRANTS_1	Grants Management Officer is responsible for the business management and other non-programmatic aspects of awards or research grant.
RESEARCH GRANTS_2	Grants Management Specialist is responsible for the day-to-day management of a portfolio of grants.
RESEARCH GRANTS_3	Administration informed the policies and procedures of the research programs to the prospective faculty members.
RESEARCH GRANTS_4	Administration informed the policies and procedures of the research programs to the prospective faculty members.
RESEARCH GRANTS_5	Faculty is financially supported in case of delay of funds in travel grants.
RESEARCH GRANTS_6	Research team is given an incentive equivalent to 10% of the research grants received from external funding agencies.
Travel grants	
TRAVEL GRANTS_1	All travel expenses are substantiated and documented.
TRAVEL GRANTS_2	Authority is responsible for approved or denied of payment of the travel expenses.
TRAVEL GRANTS_3	Approved travel grants are validated from the institute.
TRAVEL GRANTS_4	Travel grant are allowed for the faculty teachers, for research purpose.
TRAVEL GRANTS_5	Departments and institutes have same policies in term of travel grant.
TRAVEL GRANTS_6	Faculty members are paid travel grants annually on first come first served basis.
Publication and ratio papers published	
Paperpublished_1	Paperpublished_1 Faculty members receive reward on high impact factor publication.
Paperpublished_2	Paperpublished_2 Authors are from the institute and authors from outside the institute, the amount of award shall be divided by total number of authors.
Paperpublished_3	Paperpublished_3 Indirect incentives are provided on publishing more research papers in term of annual block grants buy equipment or refurbish labs, salary increment, promotion or funding for further
Paperpublished_4	Paperpublished_4 At least Rs.10, 000/- amount is fixed for each paper published in any of the reputed International Journal.
Paperpublished_5	Paperpublished_5 Cash award is provided for each paper published in any of the HEC listed Journal.
Paperpublished_6	Paperpublished_6 Faculty ranked on their publication and give reward in term of salary increase.
Publication_1	Publication Committee Promote, facilitates and monitors the timeliness of publication.
Publication_2	Publications are reviewed, edited and approved by editorial board.
PhD Output	
PhDoutput_1	Researchers are motivated and facilitated to working in research-friendly environment.
PhDoutput_2	Industries based research and innovation partnership with researchers exist.
PhDoutput_3	Research needs are readily identified.
PhDoutput_4	Institutional incentives are given to scholars for excellence in research.
PhDoutput_5	Lab facilities for indoor research and for off-campus opportunities are provided to scholars.
H-Index	
Hindex_1	Post graduate student publish one paper before thesis submission.
Hindex_2	Chair assess his or her department members by determining how many papers each person has published that are cited more.
Hindex_3	Publishing one chapter in a book is conditional before being promoted to more senior or tenure track positions
Hindex_4	Various trainings on awareness about H index scores are arranged.

Table 1: Continue

Conferences	
Conferences_1	Event committees are active to properly plan and execute events.
Conferences_2	Alumni's are encouraged in organizing conferences and other events.
Conferences_3	Faculty members are encourages arranging conference.
Conferences_4	Proper funding is provided to arrange conference.
Conferences_5	Rewards are given to the conference organizers.
Conferences_6	Guest are facilitated with pick and drop facility Lodging and boarding during the conference.
Conferences_7	Students are encouraged to involve arranging conferences.
Conferences_8	Conference advertised schedule is updated on websites and mailing list.
PERN	
PERN_1	Well established computerized networking with Computer Laboratories are existed.
PERN_2	High-speed LAN connections are available.
PERN_3	Institute have accessibility of digital library.
PERN_4	Allowance of Free use of bandwidth for educational purposes.
PERN_5	University Web Portals are well established.

known as criteria. The fifty evaluated practices were grouped into nine criteria namely: Registered patents, University industrial linkages, research grants, travel grants, publication and published papers, PhD output, H-Index, conferences and Internet Bandwidth utilization. After sorting them it is seen that criteria were associated with the nine criteria offered by HEC ranking 2015 research parameter.

Grouping of research based practices shows that twelve practices was exists in patent criteria, seven practices in university industry linkage criteria, five practices in research grant criteria, six practices in travel grant criteria, eight practices in publication and published papers criteria, five practices in PhD output criteria, four practices in H-Index criteria, eight practices in conference criteria and five practices in internet bandwidth PERN utilization criteria. After sorting these practices are titled according to their resembled criteria by HEC.

Figure 1 shows that business institute 2 was performing well than other business institutes because it adopted three patent related practices completely. First: Institute has branched to become innovation merchants to other organization, second: Faculty members were encouraged to commercialize their research work and third: Incentives was provided to disclose inventions. There was four patent related practices that were never adopted by any business institute: First: faculty members was encouraged to file for patents, second: On-campus or off-campus "technology transfer offices" (TTOs) works to intermediaries to bridge the gap between invention and commercialization, third: Small academic patenting activity that takes place, the increased focus on patenting academic inventions and licensing and forth caretakers financially facilitated to file national or foreign patent. The other practices are moderately adopted in five business institutions.

Figure 2 shows that three clusters was develop in twelve patent criteria. Cluster 1 had six homogenous practices that was very rarely adopted: Faculty members was encouraged to file for patents, institute had branched to become innovation merchants to other organization, on-campus or off-campus "Technology transfer offices" (TTOs) works to intermediaries to bridge the gap between invention and commercialization, small academic patenting activity that takes place, the increased focus on patenting academic inventions and licensing, caretakers financially facilitated to file national or foreign patent and inventor is permitted to licensed sponsorship in case of limited patent budget. Cluster 2 have two practices that was same because both are mostly adopted: Faculty members are encouraged to commercialize their research work and incentives was provided to disclose inventions like royalty sharing agreements or equity participation in academic start-ups. Cluster 3 had four practices that was frequently adopted: Young researcher's prizes was offered for inventions that was commercialized, management take decisions based on discoveries that define scientific research, faculty was under intense pressure to publish their research work or file patenting decided by management and invention can be basis on the new product per market need.

Figure 3 shows that business institute 4 and 5 was completely adopted UIL_1: which was Programs established to support the University-Industry collaboration like the "Liaison Industrialist Programs". UIL_2 "Institute promote the support of companies to participate in projects of the faculties" practice was completely adopted by business institute 1,2 and 4. Two practices was very less adopted in all business institutes except business institute1 that was: Technology transfer mechanism was actively performing various activities through licensing, arrangements consulting,

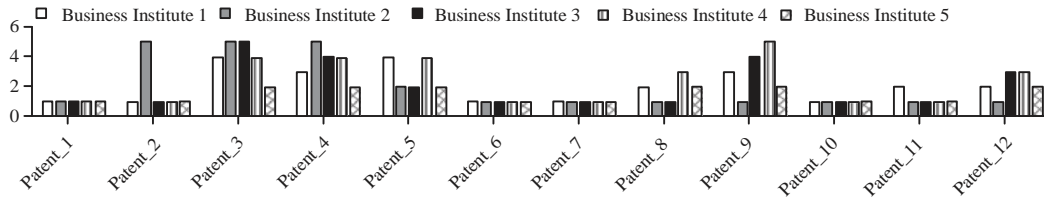


Fig. 1: Frequency chart of patent criteria

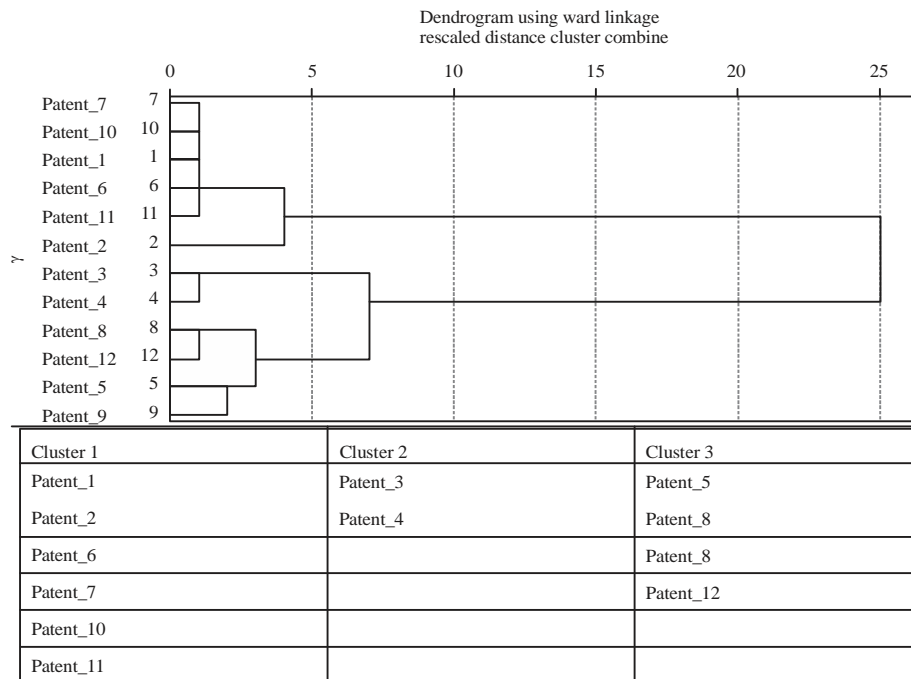


Fig. 2: Cluster wise table and dendrogram presentation of patent criteria

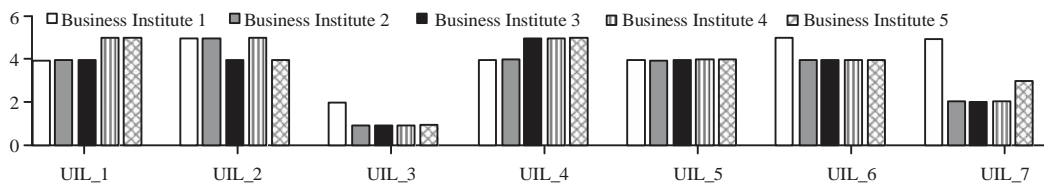


Fig. 3: Frequency chart of university industry linkage J criteria

joint or contract R and D and technical services and growing interest in the creation and support of university-related science parks and business incubators in recent years. UIL_4: Top management and representatives from all the stakeholders with the roles for industry, universities and government clearly defined was completely adopted by business institute 3,4 and 5. UIL_5 "Persons assigned to manage the linkage programs, either in universities or the public sector must had some experience with industry as well

as a flair for dealing with the private sector was mostly adopted by business institute 2, 3, 4 and 5.

Figure 4 shows that three clusters are develop. Cluster1 had five practices that are completely and mostly adopted: First: Programs established to support the University-Industry collaboration like the "Liaison Industrials Programs, second: Institute promote the support of companies to participate in projects of the faculties, third: Top management and representatives from all the stake-holders with the roles for

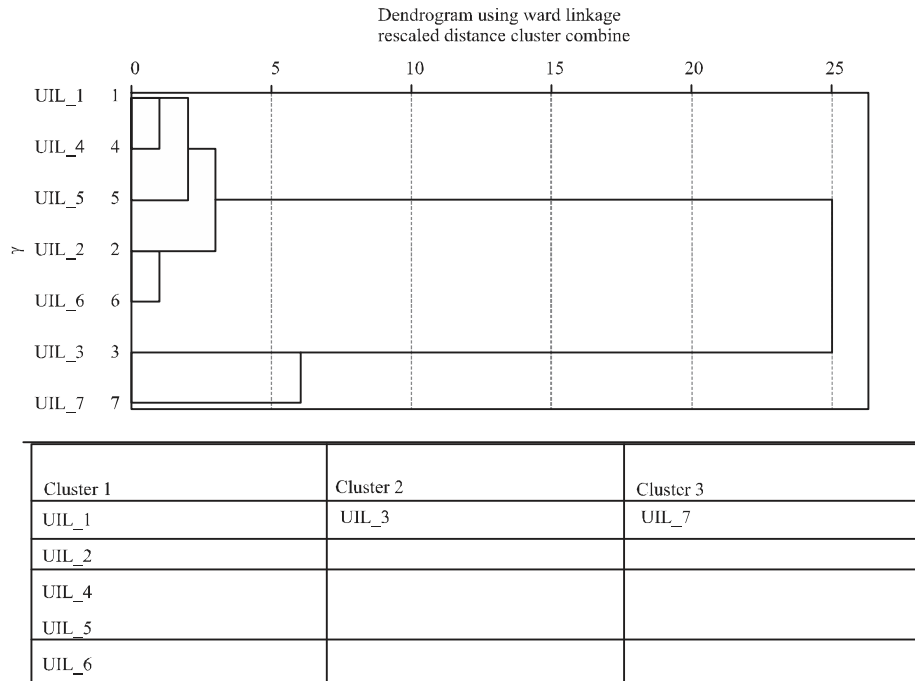


Fig. 4: Cluster wise table and dendrogram presentation of university industry criteria

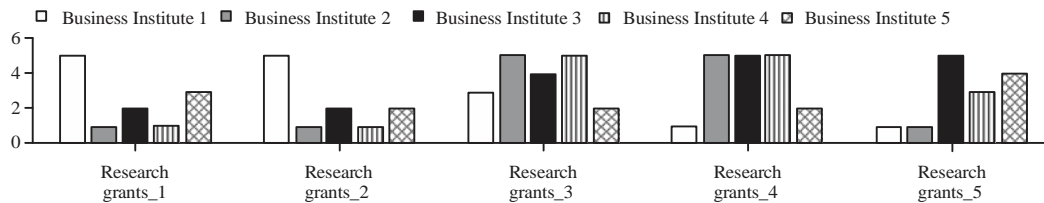


Fig. 5: Frequency chart of research grant criteria

industry, universities and government clearly defined, forth persons assigned to manage the linkage programs and sixth linkage programs that are developed was based on entrepreneurial foundations, both of university staff and of private industry, with a well thought-out development plan. Cluster2 has one practice “Technology transfer mechanism was actively performing various activities through licensing, arrangements consulting, joint or contract R and D and technical services” that was never adopted in four business institutes and rarely adopted in one business institute. Cluster 3 has also single practice that was frequently adopted “Growing interest in the creation and support of university-related Science Parks and business Incubators in recent years”.

Figure 5 Shows that business institute adopt two practices completely first research grant_1: 1 grants Management Officer was responsible for the business management and other non-programmatic aspects of awards or research grant and research grant_2: Grants management specials was responsible for the day-to-day management of a

portfolio of grants. Research grant_3: Administration informed the policies and procedures of the research programs to the prospective faculty members was moderately adopted in business institute1. However, it was completely adopted by business institute 2 and 3. Business institute 2,3 and 4 completely adopted research grant_4: Faculty was financially supported in case of delay of funds in travel grants. Business institute 3 was completely adopted research grant_5: Research team was given an incentive equivalent to 10% of the research grants received from external funding agencies however these practice was never adopted in business institute 1 and 2.

Figure 6 shows that two clusters was develop in research grant criteria. Cluster 1 had two practices: Grants management officer was responsible for the business management and other non-programmatic aspects of awards or research grant and grants Management Specialist was responsible for the day-to-day management of a portfolio of grants that was completely adopted by one business institute and moderately

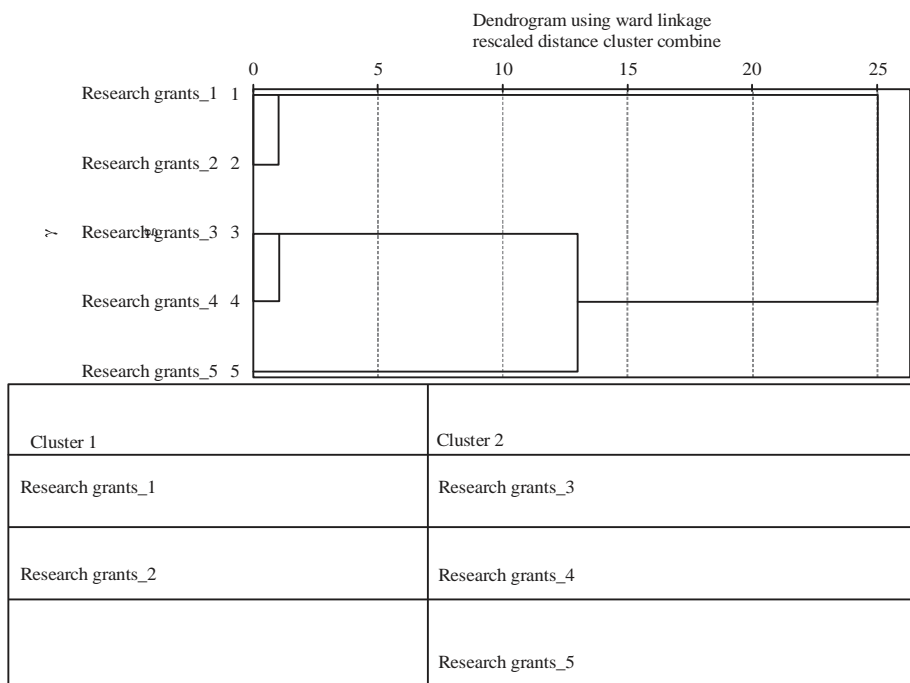


Fig. 6: Cluster wise table and dendrogram presentation of research grant criteria

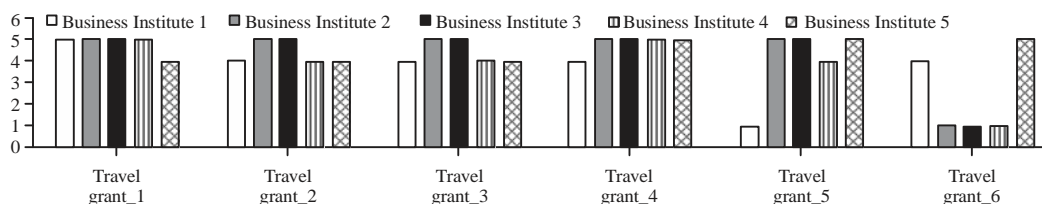


Fig. 7: Frequency chart of travel grant criteria

avoided by others. Cluster 2 had three research grant practices: Administration informed the policies and procedures of the research programs to the prospective faculty members, faculty was financially supported in case of delay of funds in travel grants and research team was given an incentive equivalent to 10% of the research grants received from external funding agencies that was more adopted in some business institutes and less adopted by some business institutes.

Figure 7 shows that travel grant_1: All travel expenses was substantiated and documented was completely adopted by four business institutions except business institute 5. Travel grant_2: Authority was responsible for approved or denied of payment of the travel expenses and travel grant_3: Approved travel grants was validated from the institute was completely adopted by business institute 2 and 3 and mostly adopted by others. Travel grant_4: Travel grant was allowed for the faculty teachers, for research purpose was completely adopted by four

business institutes. Travel grant_5: Departments and institutes had same policies in term of travel grant was completely adopted by business institute 2,3 and 5. Last practice travel grant_6: Faculty members was paid travel grants annually on first come first served basis was never adopted by three business institutes.

Figure 8 shows that three clusters was develop cluster 1 had four practices including all travel expenses was substantiated and documented, authority was responsible for approved or denied of payment of the travel expenses, approved travel grants was validated from the institute and travel grant was allowed for the faculty teachers, for research purpose, these practices was mostly adopted in the five business institutions. Cluster 2 had one practice that was departments and institutes had same policies in term of travel grant and it was frequently adopted. Cluster 3 had also one practice: faculty members was paid travel grants annually on first come first served basis and these practices

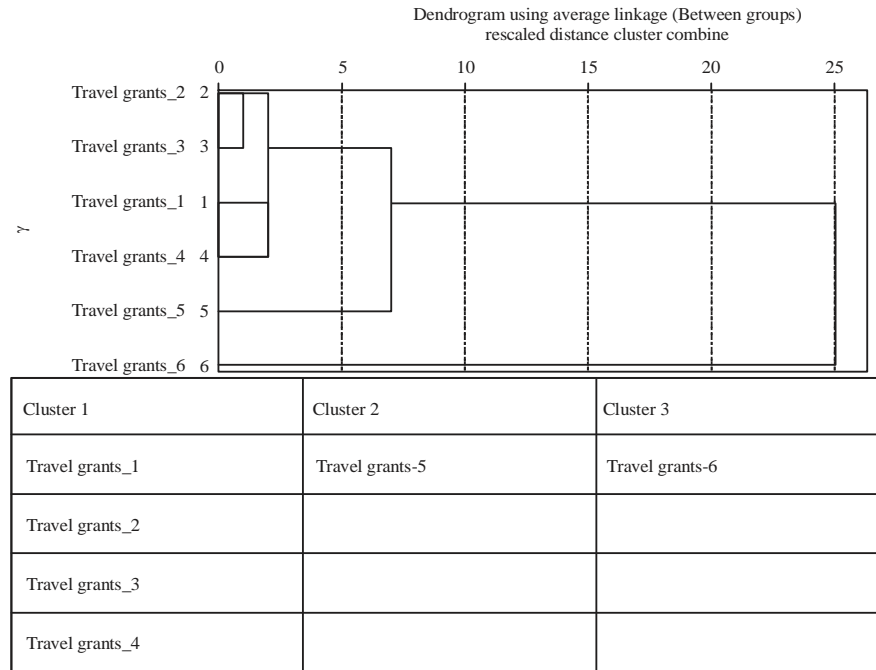


Fig. 8: Cluster wise table and dendrogram presentation of travel grant criteria

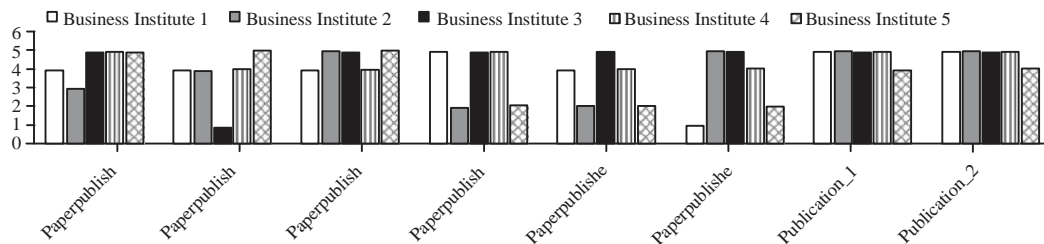


Fig. 9: Frequency chart of published paper and publication criteria

was never adopted by three business institutes and frequently adopted by others.

Figure 9 Shows that Publication_1: Faculty members receive reward on high impact factor publication was completely adopted in business institute 3,4 and 5 however business institute 5 completely adopted two other practices including Paperpublished_2 authors was from the institute and authors from outside the institute, the amount of award was divided by total number of authors and Paperpublished_3 indirect incentives was provided on publishing more research papers in term of annual block grants buy equipment or refurbish labs, salary increment, promotion. Paperpublished_4: At least Rs.10, 000/- amount was fixed for each paper published in any of the reputed International Journal was completely adopted by business institute 1,3 and4. Business institute 3 was completely adopted all practices. Paperpublished_6: Faculty ranked on their publication and

give reward in term of salary increase was never adopted by business institute1.

Figure 10 shows that three clusters was develop, cluster1 had six practices including: faculty members receive reward on high impact factor publication, indirect incentives was provided on publishing more research papers in term of annual block grants buy equipment or refurbish labs, salary increment, promotion, at least Rs.10, 000/- amount was fixed for each paper published in any of the reputed International Journal, cash award was provided for each paper published in any of the HEC listed Journal, publication Committee Promote, facilitates and monitors the timeliness of publication and publications was reviewed, edited and approved by editorial board these all practices was mostly adopted in the five business institutions. Cluster2 had single practice: authors was from the institute and authors from outside the institute, the amount of award shall be divided by total number of authors,

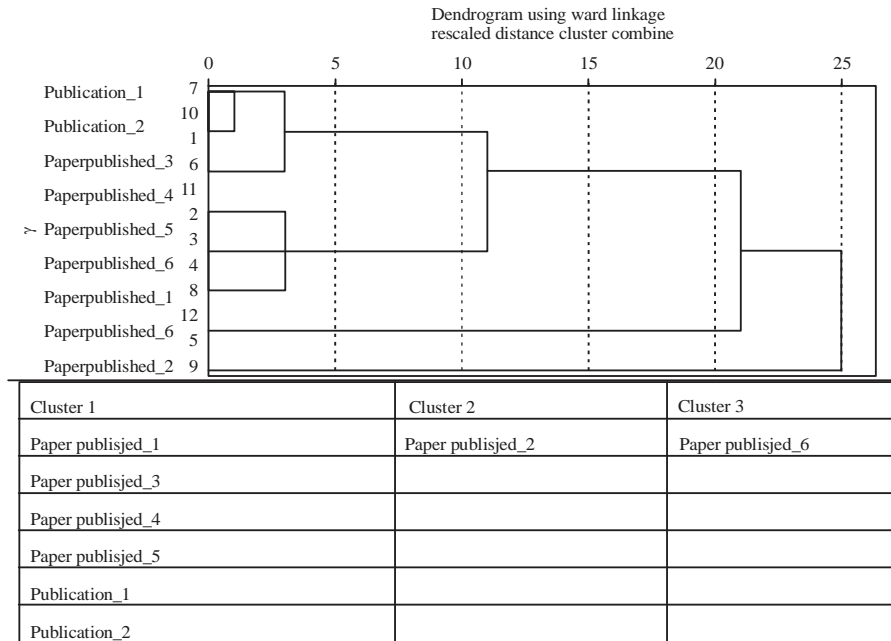


Fig. 10: Cluster wise table and dendrogram presentation of published paper and publication grant criteria

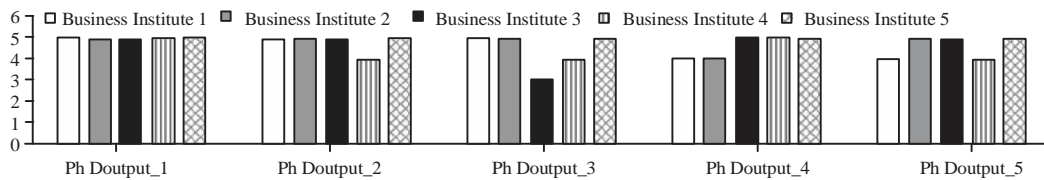


Fig. 11: Frequency chart of PhD output criteria

this practice was never adopted by one business institute mostly adopted by three business institutes and completely adopted by one business institute. Cluster 3 had also one practice: faculty ranked on their publication and give reward in term of salary increase, it is frequently adopted.

Figure 11 shows that PhDoutput_1: Researchers was motivated and facilitated to working in research-friendly environment was completely adopted by five business institutions. PhDoutput_2: Industries based research and innovation partnership with researchers exist was completely adopted by four business institutions except business institute 4. Business institute 5 completely adopted all PhD output related practices. No any practice was never adopted only PhDoutput_3: Research needs are readily identified was less adopted in business institute 3.

Figure 12 shows that three clusters was develop cluster1 had three practices that was completely adopted including researchers was motivated and facilitated to working in research-friendly environment, industries based research and innovation partnership with researchers exist and lab facilities for indoor research and for off -campus opportunities was

provided to scholars. cluster2 had one practice: research needs were readily identified, it was moderately adopted in one business institute and mostly adopted in others. Clustyer3 had one practice: Institutional incentives were given to scholars for excellence in research, it was completely adopted in three business institutes and mostly adopted in other two.

Figure 13 shows that Hindex_1: Post graduate student publish one paper before thesis submission was completely adopted by four business institutions except business institute 5. Hindex_2: Chair assess was or her department members by determining how many papers each person had published that was cited more and Hindex_4: Various trainings on awareness about H index scores was arranged were completely adopted by business institute 3 and less adopted by business institute 2. Hindex_3: Publishing one chapter in a book was conditional before being promoted to more senior or tenure track positions was never adopted by business institutes 1,2 and 5.

Figure 14 shows that two clusters was develop. Cluster1 had three practices: post graduate student publishes one paper before thesis submission, chair assess had or her

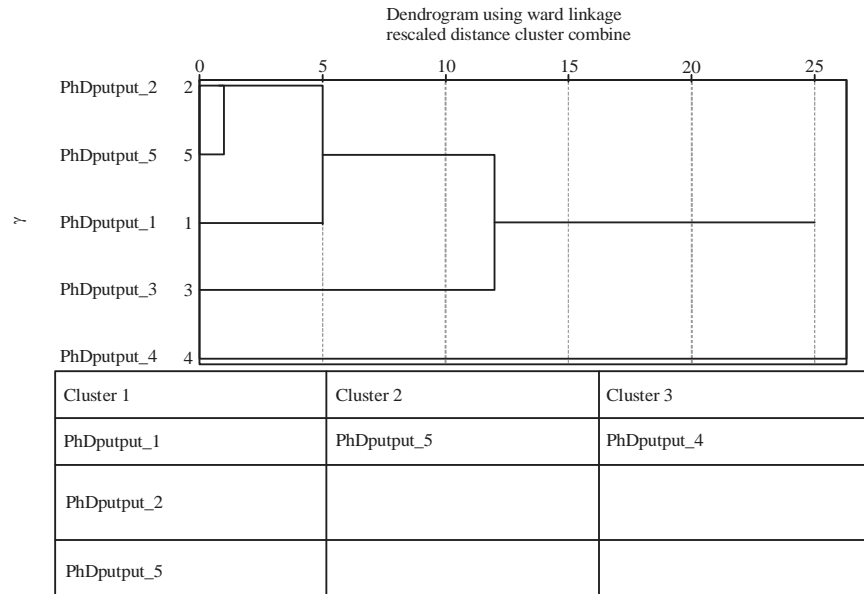


Fig. 12: Cluster wise table and dendrogram presentation of PhD output criteria

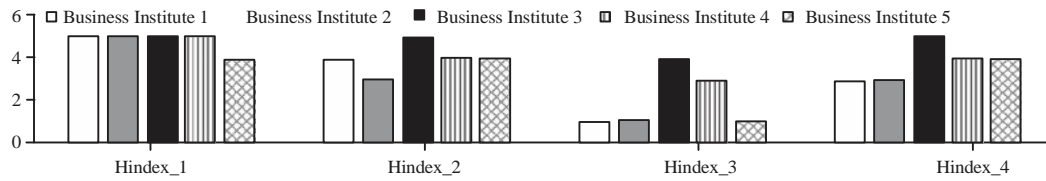


Fig. 13: Frequency chart of H-Index

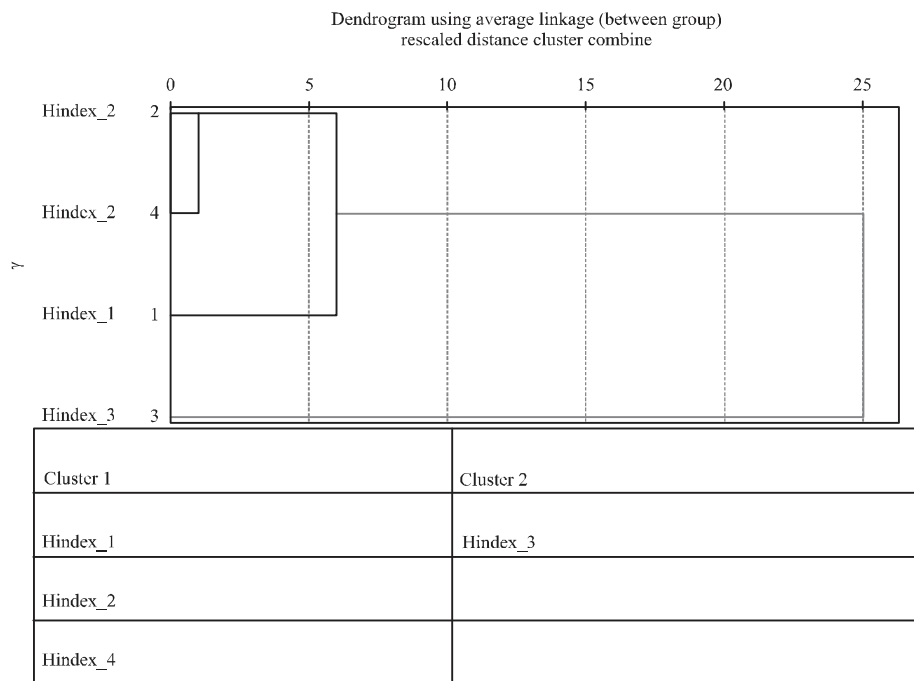


Fig. 14: Cluster wise table and dendrogram presentation of H-Index criteria

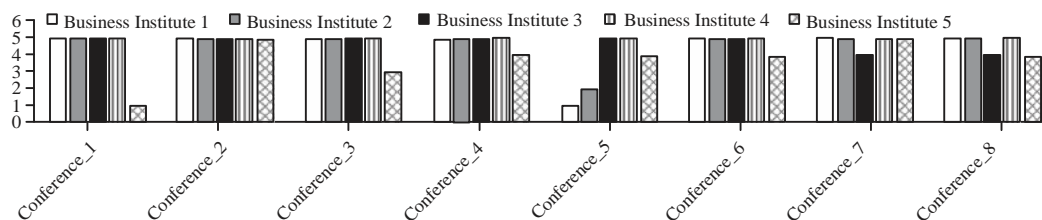


Fig. 15: Frequency chart of conferences criteria

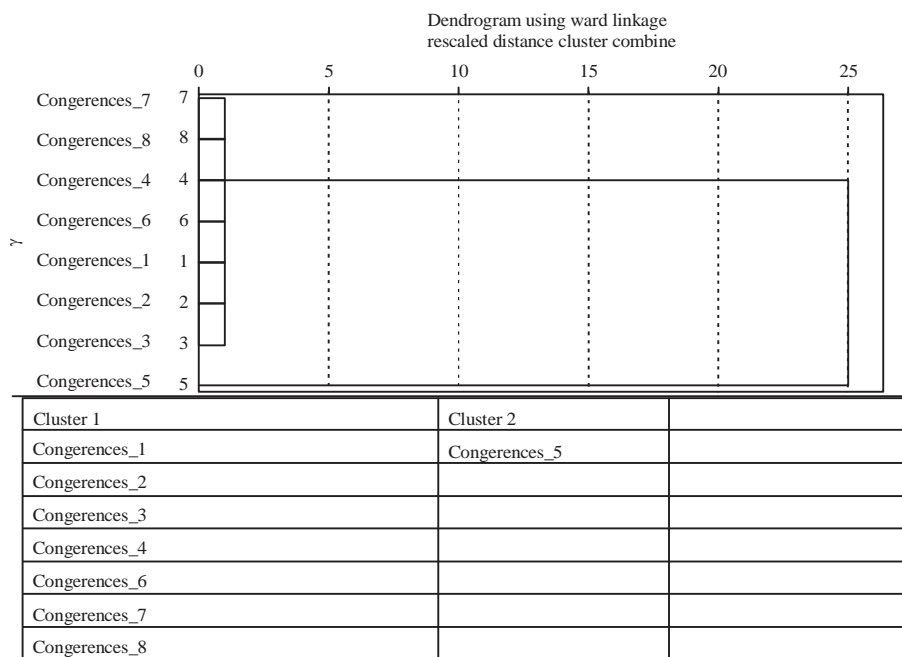


Fig. 16: Cluster wise table and dendrogram presentation of conferences criteria

department members by determining how many papers each person has published that are cited more and various trainings on awareness about H index scores was arranged these practices was mostly and completely adopted. Cluster 2 had only a single practice: Published one chapter in a book was conditional before being promoted to more senior or tenure track positions and this practice was never adopted by three business institutes.

Figure 15 shows that five conference related practices was completely adopted by business institutions 1,2,3 and 4 including: Conferences_1: Event committees were active to properly plan and execute events, Conferences_2: Alumni was encouraged in organizing conferences and other events., Conferences_3: Faculty members were encouraging arranging conference , Conferences_4: Proper funding was provided to arrange conference and Conferences_6: Guest are facilitated with pick and drop facility Lodging and boarding during the conference. Business institute1 was never adopted

Congerences_5: Rewards were given to the conference organizers. The remaining two practices Conferences_7: Students were encouraged to involve arranging conferences and Conferences_8: Conference advertised schedule was updated on websites and mailing list are frequently adopted.

Figure 16 shows that two clusters are develop cluster1 had seven practices: Event committees was active to properly plan and execute events, alumni were encouraged in organizing conferences and other events, faculty members were encouraging arranging conference, proper funding was provided to arrange conference, guest was facilitated with pick and drop facility Lodging and boarding during the conference, students was encouraged to involve arranging conferences and conference advertised schedule was updated on websites and mailing list was frequently adopted all these practices was mostly adopted. Cluster2 had only single practice that was rewards was given to the conference organizers, this practice was never and rarely

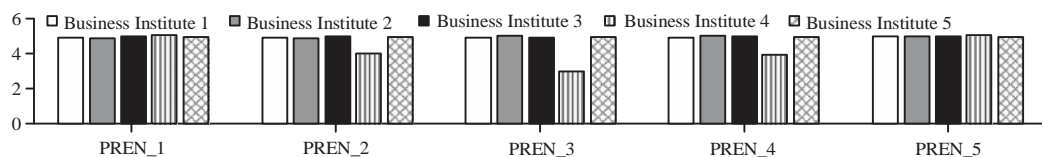


Fig. 17: Frequency chart of internet bandwidth PERN criteria

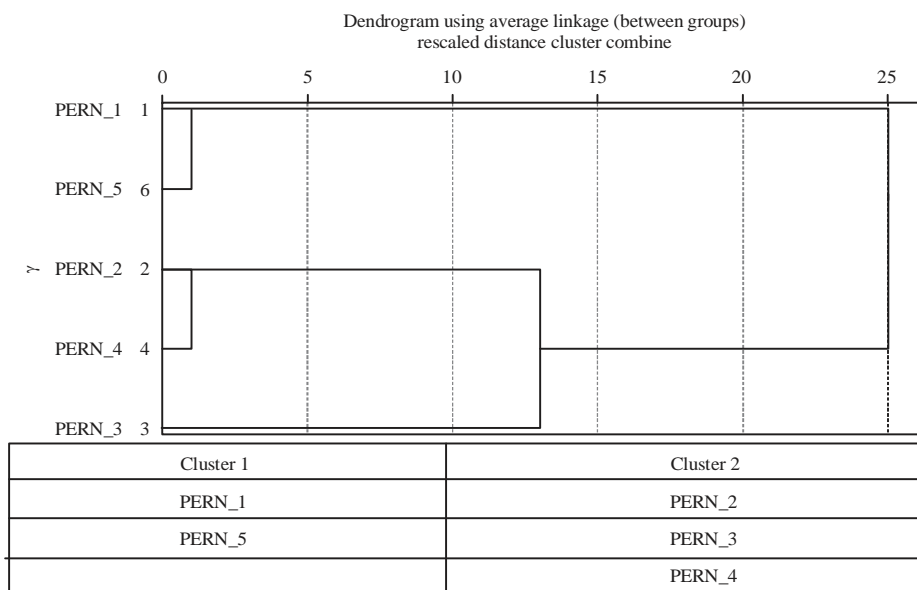


Fig. 18: Cluster wise table and dendrogram presentation of Internet Bandwidth PERN utilization criteria

adopted by two business institutes and mostly adopted by one business institute.

Figure 17 shows that two practices were completely adopted by five business institutes; they are: PERN_1: Well established computerized networking with Computer Laboratories existing and PERN_5: University Web Portals were well established. Three practices were completely adopted by business institutes 1, 2, 3, and 5 and rarely adopted by business institute 4; they were: PERN_2: High-speed LAN connections were available, PERN_3: Institute had accessibility of digital library, and PERN_4: Allowance of free use of bandwidth for educational purposes.

Figure 18 shows that two clusters were developed. Cluster 1 had two practices that were completely adopted: Well established computerized networking with Computer Laboratories existing and university Web Portals were well established. Cluster 2 had three practices: high-speed LAN connections were available, institute had accessibility of digital library, and allowance of free use of bandwidth for educational purposes. From these, some were completely adopted, some were mostly adopted, and few were less adopted.

DISCUSSION

In view of the paucity of research in higher education institutions (HEIs), the Commission on Higher Education provided policies and mandates that are largely geared towards the improvement of research productivity⁴. Governments and university managers, especially in some European countries, have tended to favor start-ups as opposed to licensing strategies. Part of this stems from the rise in government-funded venture funds that aim to promote new firm creation in research culture⁵. One of the top factors that distinguishes a research university from one that limits itself to teaching is that the former has access to public funding that is "consistent and long term". Disappointingly, investment in research is demonstrably insufficient⁹.

The results reveal that there are various practices in terms of research that are absent or avoided by business institutes such as: Faculty members are encouraged to file for patents, on-campus or off-campus "technology transfer offices" (TTOs) works to intermediaries to bridge the gap between invention and commercialization, Small amount of (formal) academic patenting activity that takes place, the increased focus on

patenting academic inventions and licensing and caretakers financially facilitated to file national or foreign patent are never adopted by five business institutes. However, Business Institutes are more focusing on these practices: Researchers are motivated and facilitated to working in research-friendly environment, alumni are encouraged in organizing conferences and other events and the availability of high speed LAN connections.

Literature as contrast discuss some other practices that can contribute a major part in the research culture for example To promote the research culture in the higher education institutions needs to: to develop a research sector that is dynamic and has the capacity to respond flexibly to a changing research environment, to work with the sector to develop a system for assessing research that enhances the power of the national research base and assists institutions in identifying and fostering excellence, to ensure academic programs address needs of industry, the market and the community, to support the continuing development of the physical infrastructure for learning and teaching, so that this remains fully fit for purpose and delivers excellent provision, to facilitate enhancement of enrollment in Post-graduate programs, To establish think tanks and policy research centers, to launch a Knowledge Transfer Program providing opportunities for university funding to solve industrial problems ,to launch a Small Business Innovative Research Grant program to facilitate stage-wise commercialization of university research, to set up business incubation centers in major universities and to establish Technology, Agriculture and Business Parks in the vicinity of universities².

CONCLUSION

This study overall conclude that four research based practices are never adopted by five business institutes: Faculty members are encouraged to file for patent, on-campus or off-campus "Technology transfer offices" (TTOs) works to intermediaries to bridge the gap between invention and commercialization, small amount of (formal) academic patenting activity that takes place, the increased focus on patenting academic inventions and licensing, caretakers financially facilitated to file national or foreign patent are never adopted by five business institutes. If institutes can adopt these practices they enable to improve their standards.

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