

Leveraging Academic Library Services to Foster Innovation and Entrepreneurship Education in Higher Education Institutions

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Abstract

The importance is being certain in innovation and entrepreneurship by higher education institutions as key graduate attributes in the new knowledge-based economy. Academic libraries are assuming a better role in fostering creativity and innovativeness among educators and students and no longer help the same purpose as their historical support to classroom education and research as an auxiliary resource. This study examines how academic libraries can be beneficial in supporting entrepreneurship and innovation courses. It studies the ways in which libraries are progressively playing a more significant role in supportive the process of entrepreneurial education and business creation by making resources available (including digital repositories, makerspaces, data analytics, research consultation, and market intelligence databases). The research also determines that the ability of students to recognize opportunities, confirm ideas, and make evidence-based decisions is made improved with the knowledge of the librarians on information literacy, research methodologies, and digital scholarship. The study shows that libraries, business schools, incubators and industry partners should collaborate in generating innovation ecosystems on campus. The enclosure of library

resources in the sustenance programs of startups and in experiential learning opportunities and courses in entrepreneurship promotions students in the evolution of theoretical knowledge increased in the classroom to applied application in the real world. Based on the findings, academic libraries play a significant role in encouraging transdisciplinary collaboration, widening access to resources of innovation, and constancy of entrepreneurial cultures in the long-term. Ultimately, through applying academic library services, the institutions are in an improved position to produce inspired graduates who can indeed make a practical impact on the world in the form of economic development and social transformation.

Keywords: Leveraging Academic Library Services (LALS), Innovation (II), Entrepreneurship Education (EE), Higher Education Institutions (HEI).

Introduction

With the development of the universal knowledge economy, higher education institutions are now become the key players in the process of fostering innovation, entrepreneurship and sustainable economic growth (Omodan, 2024). Universities are no longer limited to their old meanings as institutions of instruction and theoretical research; instead, they are supposed to develop entrepreneurial skills, be creative, and help convert knowledge into practical and commercially viable solutions. Therefore, innovation and entrepreneurship education has emerged as part of higher education policy and practice to prepare graduates with the ability to respond to the challenges and demands of the complex society

and dynamic labor market (Gupta, 2025b). Education about innovation and entrepreneurship focuses on acquiring problem-solving skills, creativity, risk-taking skills, and interdisciplinary thinking. These competencies are needed not only to create a business, but it also involves social innovation, technological development, and institutional change. Although academic faculties, technology transfer workplaces, and industry relationships are typically recognized as pillars of entrepreneurial ecosystems in universities, the strategic role of academic libraries in sustaining these educational goals has been receiving attention of various scholars significantly (Adigun et al., 2024). The academic libraries with their vibrant services and structures are placed in a special position to be able to contribute to the innovations-based learning settings. Academic libraries have always been a source of academic learning and they provide access to books, journals and reference materials to facilitate teaching and research (Hojeij, 2024). But the fast development of the technologies, informational resources digitization, as well as the changes in pedagogical strategies, have significantly changed the functions of libraries. Modern academic libraries have changed to become vibrant knowledge communities, which support collaboration of digital scholarship and experiential learning. This change is closely associated with the objectives of innovation and entrepreneurship education that involve the ability to learn flexibly, the possibility to access a wide range of information, and the encouragement of creative exploration. Over the past few years, the subject of innovation and entrepreneurship education is one of the main focuses of higher education institutions in the world. Universities are not just hypothetical to produce graduates with disciplinary knowledge; but also, to produce creative thinkers, problem solvers and job creators who will be able to adapt to the fast changing economic and social environments. Accordingly, there has been an increase of entrepreneurial education past business schools into transdisciplinary courses, incubators, innovation hubs, and experiential models of learning at campuses. In the widening academic environment, university libraries are being recognized as key players in innovation and entrepreneurial learning in place of being the repositories of books and scientific literature. Historically, the work of university libraries was based on the service to teaching and research by increasing the collections, reference services, and

access to information. However, the informational revolutionization of resources, along with the changes in the pedagogical methods, has a significant impact on the broadening of the library services. To-day academic libraries have access to specialist databases, market and industry research, patent and intellectual property databases, data analytics platforms, and digital repositories which are relevant directly to the process of entrepreneurship. These resources assist in significant innovation process phases such as identifying opportunities, testing an idea, conducting an external analysis and designing a business. Furthermore, university libraries are also vital in fostering information literacy and research competencies, which are key competencies to be employed in innovation and entrepreneurship. The entrepreneurial leader needs to be able to explore, evaluate and integrate various pieces of information to make sound decisions in uncertain environments. Furthermore, one of the basic needs of entrepreneurial activity is to access reliable and comprehensive information. In innovative driven learning the factors various have great significance including market intelligence, technological trends, competitive analysis, and interdisciplinary research. Academic libraries are very important in giving systematic access to these resources by using special databases, online repositories, and licensed research engines (Suparwadi et al., 2024). These services allow the students and researchers to perform feasibility studies, determine potentials of the market, and test available solutions. Libraries can enhance access to high-quality information fairly to reduce the informational and financial barriers that have a tendency to delay innovators at the initial stages and student entrepreneurs. Besides access to information, academic libraries also promote innovation and entrepreneurship learning by enhancing information literacy and research skills (Monyela and Tella, 2024). A successful entrepreneur is a person who can effectively evaluate and analyze information, synthesize knowledge based on various sources, and make decisions under uncertainty conditions. Instructional programs led by libraries are becoming more dedicated to data literacy and digital research skills as well as ethical use of information (Rosienkiewicz et al., 2024). The abilities are closely related to the entrepreneurial learning consequences, as they facilitate evidence-based innovation and liable use of knowledge. Librarians also help learners to

cross multi-faceted information ecosystems through workshops, especially curriculum-based sessions, and individual research consultation. Academic libraries also contribute to the development of innovation due to the physical and online learning environments. To provide a collaborative workspace, makerspaces, and digital laboratories with advanced technologies, many libraries have redesigned their infrastructures. Libraries allow students from wide range of academic profiles work together on innovative ideas, prototypes, and business models by providing neutral and inclusive environments that cut across departmental lines (Aslam et al., 2025). This kind of places facilitates experiential learning models that are becoming more popular in the teaching of entrepreneurship. In addition, the academic libraries also promote the teaching of innovation and entrepreneurship by working with faculty and institutional programs. Apart from this, libraries contribute to the innovation efforts of the faculty by helping with grant research, impact evaluation, and scholarly publication, enhancing the overall innovation potential of institutions of higher education (Jayabalan and Dorasamy, 2024). The other important dimension of library support is associated with the level of intellectual property awareness and knowledge dissemination. Although academic libraries are not directly involved in commercialization procedures, they provide facilitating role in terms of providing instructions on how to search patents, copyright, and publish openly (Dubay and Richards, 2024). Furthermore, academic libraries are tackling the issue of outreach and community-related efforts that take innovation and entrepreneurship education distinct from the facility. Libraries tend to serve as a point of contact with the external stakeholders of the university, such as startups, industry professionals, policymakers, and local communities. Although the contributions of academic libraries in to innovation and entrepreneurship education are increasingly becoming relevant, they are not always reflected in institutional strategies. The scope of library services can be limited by these challenges including lack of funding, changing technological needs, and the necessity of continuous professional growth. Also, there is a methodological problem of measuring what the library efforts are producing in terms of entrepreneurship (Haryanto et al., 2024). To solve these challenges, it is necessary to plan deliberately, provide institutional support, and create evaluation

systems that will define libraries as active participants in the educational process of innovations. Libraries play a key role in nurturing innovative and entrepreneurial skills through the provision of informational resources, development of necessary literacies, and the establishment of collaborative environments, as well as, facilitating research and knowledge transfer (Otiike and Kiszl, 2024).

Literature Review

The academic literature on innovation and entrepreneurship education has increased significantly in the last two decades, demonstrating that universities are rapidly becoming regarded as agents of economic and social development. Researchers of entrepreneurship education have noted that the education of teaching has not been centered on traditional business courses, but rather on problem-based, cross-disciplinary and hands-on models (Shahzad et al., 2026). It has been demonstrated that good entrepreneurship training integrates creative thinking, opportunity identification, and applied research expertise in numerous areas. According to scholars, this type of learning requires institutional environments that encourage exploration, experimentation and practice. This has led to the creation of support systems by universities that are out of the classroom. Most researcher have examines the impact of higher educational resources on the success of entrepreneurship (Shao et al., 2024). They discover that information access, digital tools, and collaborative areas enhance the innovativeness of students. Researchers observe that the presence of integrated support systems in universities increases the culture of entrepreneurship, as well as the engagement of students (Nor et al., 2025). However, initial work focused primarily on incubators, accelerators, and industrial connections and did not afford much space to academic libraries. The recent literature reflects the importance of academic libraries as a key university knowledge system. Apart from this, libraries enhance innovation through organizing, curating and making access to intricate information possible (Altwaijri et al., 2024). In comparison to commercial vendors, academic libraries are interested in equal access, long term preservation and cross-disciplinary discovery. These abilities are beneficial for innovators and entrepreneurs, who required a large amount of reliable and accurate data to develop and exchange their ideas (Santos et al., 2024). New

research techniques are now supported by the libraries in the form of preprints, datasets, and open-knowledge platforms. This larger access allows users to relate fields of study in new various ways with an important component of creative thinking. There is a considerable amount of literature which examines the relationship between information literacy and entrepreneurial talent. According to researchers, the innovation needs not only creativity, but it also needs a skill to evaluate the quality of information, the credibility of information, and its relevance (Dada, 2025). Research indicates that inadequate information assessment and limited knowledge of the market are prevalent factors that lead to business failure. With this consideration, academic library teaching is observed to become a strategic component of entrepreneurship training. Furthermore, studies indicate that information literacy programs led by the library enhance the analytical thinking, decision making, and problem solving by the students (Ul Hassan et al., 2025). The skills are essential to the entrepreneurial activities such as opportunity recognition, risk evaluation, and strategic planning. Researchers further state that data literacy and digital research competencies are essential in technology-intensive entrepreneurship. The literature is now concerned about transforming academic libraries into experiential learning communities. According to researchers, design of physical places determines the way of user's learning, be creative, and working together. The studies of digital learning prove that libraries become an objective location where students with different backgrounds meet and share their thoughts. This interdisciplinary amalgamation often results into innovation (Prokopenko et al., 2024). Research on library makerspaces asserts that the presence of prototyping and digital fabrication tools that allow students to engage in hands-on entrepreneurship learning. The rooms assist the learners in converting ideas into actual prototyping, which promotes a cycle of practice. The results demonstrate that students involved in using makerspaces feel more confident about creativity and awareness of innovation. Libraries provide these spaces in open environments, which are accessible to any program (Bello, 2025). The other major area of study is the transformation of the role of academic librarians. Researchers indicate that now librarians are research companions, instructing partners and innovation facilitators. They have useful abilities relating to research methods, data management, and

scholarly communication that can be applied to the training of entrepreneurship. Librarians assist the faculty to plan research-based courses and interdisciplinary projects. Librarian faculty collaboration studies indicate that there are advantages to curriculum and student learning (Gupta, 2025a). According to scholars, implementing librarians in entrepreneurship programs enhances the coherence in teaching and utilization of resources. The librarians also assist faculty with impact evaluation of their research, bibliometrics and grant applications. These services enhance the strength of institutional research and indirectly contribute to the outcomes of entrepreneurship (AlQhtani, 2025). Researchers indicate that libraries help people in searching patents, copyright restrictions, and open-access publishing. This assistance enables innovators to decide on the way of protecting and sharing their work. Studies also indicate conflict between open knowledge and commercial interests and imply that libraries can assist users to balance and maintain ethical sharing. Researchers indicate that libraries help people in searching patents, copyright restrictions, and open-access publishing. This assistance enables innovators to decide on the way of protecting and sharing their work. Studies also indicate conflict between open knowledge and commercial interests and imply that libraries can assist users to balance and maintain ethical sharing (Khongmalai and Distanont, 2024). Recent research examines the manner in which academic libraries interact with external innovation systems. According to researchers, libraries are connecting the university with the industry, startups, and communities. This initiative makes entrepreneurship education more expansive. Research on regional innovation systems asserts that libraries facilitate the inclusive innovation by providing the public with access to resources and learning (Mitha and Omarsaib, 2025). These lifelong learning and entrepreneurship activities are based on various groups. The study findings reveal that this kind of engagement enhances the social impact of universities and improves their innovation objectives. Although there is increased awareness, scholars indicate that there are a few challenges which curtail the role of libraries in the education of entrepreneurship. They involve challenges such as inadequate resources, rapidly evolving technology and ineffective institutional support. Researchers also observe that there are no standard ways of evaluating library-

initiated innovation projects. The literature indicates that there is a need to conduct more empirical research on the direct relationship between library service and entrepreneurial performance (Patrício et al., 2024). Scholars emphasize that to address the complexity of library impact, research needs to be conducted over time and in mixed methods. Addressing these gaps would provide more solid evidence to support the connection between libraries and institutional innovations plans. Librarians play a role in this process as experts dispensers of information because they provide research consultation, workshops and embedded education that is specifically geared towards the needs of entrepreneurship. With the aid of such services, libraries serve students and staff to convert information into action knowledge and thus improve the results of entrepreneurship. Other than supplying information, most university libraries have transformed both the physical and virtual space to create creativity and collaboration. Makerspaces, innovation studios, and digital media studios located in libraries offer practical spaces where students are able to design ideas and experiment with new technology and work across disciplines. The spaces are closely associated with experiential forms of learning that emphasize learning through doing, which is a fundamental tenet of entrepreneurial education. Libraries can democratize participation in entrepreneurial activities in different student groups by establishing inclusive and accessible innovation spaces. Moreover, academic libraries are working in conjunction with other departments in the institution such as business schools, technology transfer office, start-up incubator and industry affiliates. The libraries are important components of the innovation systems within the campuses through such arrangements. Combined programs, mentoring and resource sharing can assist libraries to develop a culture of innovation, experimentation and sharing of knowledge. Such teamwork activities have the potential to maximize the existence and effectiveness of library services to promote the institutional entrepreneurial agendas. The provided overview supports the research that seeks to investigate the possibilities of academic library services as one of the strategic instruments that may be applied to foster the advancement of innovation and entrepreneurship education within the institutions of higher learning. The academic libraries are the main accelerator variable in the environment of the entrepreneurial learning and innovation-driven development because

they restructure their roles, diversify their service portfolios, and make them aligned with the missions of the institutions.

Methodology

Research Methodology

The research design is the quantitative research design in which the researcher focuses on determining the possibilities of the academic library services to support the innovation and entrepreneurship education in the universities. The quantitative method will be able to have an in-depth knowledge of the tactics, practices, and experiences of librarians, professors and students utilizing library resources to learn entrepreneurship. The research is both descriptive and interpretive because it aims at capturing the different multifaceted roles of libraries in supporting innovation ecosystem in academia.

Data Collection

The sources used to get the data were many to have comprehensive insights. One was the semi-structured interview on academic librarians, entrepreneurship faculty, and students involved in innovation activities. These interviews revolved around the types of library services which had been used, how they had been perceived to influence entrepreneurial capabilities as well as actions taken by them in collaboration with other units in the institution. Second, institutional reports, library strategic plans, and entrepreneurship program curriculum were analyzed on paper to provide contextual data of library involvement in innovation education. Third, library makerspaces, innovation laboratories, and digital repositories were visited with observational purposes to research the infrastructure, tools, and support mechanisms that users have.

Sample

A purposive sample method was followed to select participants who had the required expertise in academic libraries and entrepreneurship programs. The sample included librarians who carry out services related to innovation, academic members who conduct entrepreneurship classes and students who are actively involved in startup or innovation projects. This was a method which made sure that the data obtained became rich and directly pertinent to the research objectives.

Analysis of Data

Thematic analysis was applied in the analysis of data obtained. The transcription and processing of interviews were done to identify repetitive themes, patterns, and links between library services and the results of entrepreneurship. Triangulation of document

and observational data with interview results was done to confirm information and enhance reliability. Some of the major themes were the availability of specific resources, assistance with information literacy, collaboration opportunities, and learning environments with experience.

Table 1: Descriptive Statistics for Key Study Variables.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Leveraging academic library services	51	1.00	3.00	1.5882	.66862
Foster innovation	51	1.00	3.00	1.5294	.61165
Entrepreneurship education	51	1.00	3.00	1.6078	.60261
Higher education institutions	51	1.00	3.00	1.6471	.62685

Valid N (list wise)	51	shows that positive average rate and 66% deviate from
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The above result demonstrate that descriptive statistical analysis included minimum values, maximum values, the mean values, the standard deviation values of each variable. The leveraging academic library services is main variable its shows that mean value is 1.5882 the standard deviation rate is 0.66862 result

mean values. Similarly, foster innovation represent that mean value is 1.5294 the standard deviation rate is 0.61165 its shows that positive and 61% deviate from mean values. Similarly, the entrepreneurship education and higher education institutions both variables consider as 60% and 62% deviate from mean values.

Regression Analysis

Table 2: Multiple Linear Regression Coefficients for Higher Education Institutions.

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.510	.443		1.150	.256
	Leveraging academic library services	.277	.134	.295	2.058	.045
	Foster innovation	.360	.150	.352	2.400	.020
	Entrepreneurship education	.091	.152	.088	.599	.552

a. Dependent Variable: higher education institutions

The above result demonstrates that Unstandardized coefficient analysis, the Standardized coefficient analysis included beta values, the t statistical analysis also that explain the significant value of each variables included independent. The leveraging academic library services is main independent variable result describe that its unstandardized coefficient rate is 0.277 respectively. The t statistic rate is 2.058 the significant value is 0.045 shows that positive and 4% significant rate between

them. The foster innovation is mediator variable its t statistic value is 2.400 the significant value is 0.020 its shows that positive and 2% significant link in between foster innovation and higher education institution. The entrepreneurship education shows that positive t statistic value is 0.59 the significant rate is 0.552 its shows that positive and 55% significant values between the entrepreneurship education and higher education institution.

Table 3: Chi-Square Test Statistics for Key Variables.

Test Statistics				
	Leveraging Academic Library Services	Foster Innovation	Entrepreneurship Education	Higher Education Institutions
Chi-Square	13.765 ^a	18.353 ^a	17.412 ^a	15.176 ^a
df	2	2	2	2
Asymp. Sig.	.001	.000	.000	.001

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 17.0.

The above result demonstrate that test statistical analysis included chi square analysis, also that significant rates of each variables included independent and dependent. The leveraging academic library services is main independent variable its chi square rate is 13.765. the foster innovation shows 18.353

positive chi square similarly, the entrepreneurship education shows 17.412 positive chi square respectively. The overall significant rate is 0.000 shows that 100% significant levels between them according to the result the chi square value of higher education institutions is 15.176 respectively.

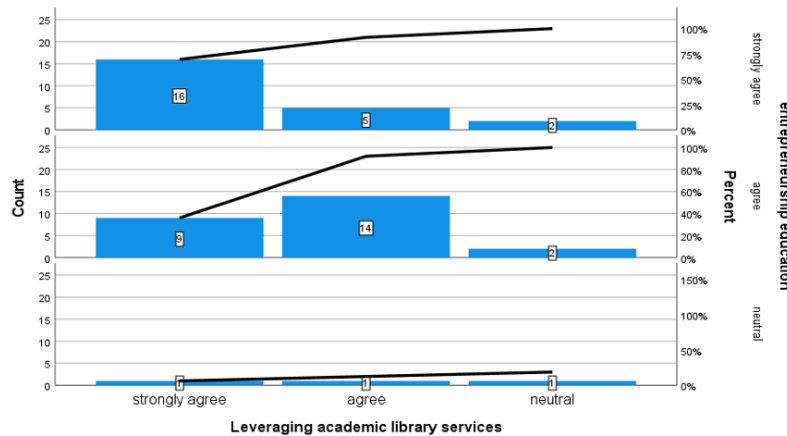


Figure 1: Chart Analysis in between Leveraging Academic Library Services and Entrepreneurship Education.



Figure 2: Example of a Modern Academic Library Collaborative Space.

Applications of Academic Library Services in Fostering Innovation and Entrepreneurship Education

Academic libraries are getting recognized as key collaborators in promoting innovation and entrepreneurship within the institutions of higher learning. Their growing contribution to more than mere information dissemination is in active entrepreneurship learning, innovation incubation, and experience learning. This sub-description explains the diverse uses of library services in the field of innovation and entrepreneurship, with particular emphasis on the particular projects, practices and tools that help in entrepreneurial education and venture building.

1. Access to Specialized Information Resources:

The provision of access to the specialized information resources facilitating market research, business planning, and innovation processes is one of the most important applications of academic libraries to entrepreneurship education. These are databases on the market intelligence, patent, industry reports, and competition, which are subscribed by libraries and are helpful in identifying opportunities and assessing feasibility. An example of such databases includes as ProQuest, Crunchbase, Mintel, and Statista, which contain information on market trends, consumers, and future technologies such that they allow students and professors to make evidence-based decisions. Opening intellectual property databases and patent

archives, libraries can help would-be entrepreneurs to explore new ideas, and bypass infringement challenges and create competitive advantages. These resources assist in enhancing the understanding of the students on the intellectual property management, licensing

and commercialization, which are important skills in entrepreneurship. Moreover, the digital repositories and open access periodicals offer interdisciplinary knowledge, which encourages technological, design, business, and social entrepreneurship.



Figure 3: The Multidimensional Scope of Information Literacy.

2. Developing Information Literacy and Research Skills

Creativity and entrepreneurship are fundamental capabilities stipulated with the information literacy and academic libraries have a significant role to play in fostering these skills. Workshops, tutorials and one-on-one consultation Librarians also teach students how to find, evaluate, and synthesize the appropriate material. This includes skills in the area of learning the market trends, evaluating research in science or technology and learning of regulatory systems. As an illustration, students who are undertaking startup ventures can use library training to access and process competition intelligence fast or confirm business models. Training learners with strong research skills enables them to make sound decisions, kill the uncertainty, and create data solutions. Introduction of information literacy into entrepreneurship courses will ensure that the students not only become generators of ideas but also critical consumers and knowledge evaluators.

3. Makerspaces and Innovation Labs

In modern university libraries makerspaces and innovation laboratories are on the rise providing physical space through which students can prototype things, experiment with novel technology, and collaborate across disciplines. Such studios are typically designed to include 3D printers, electronics, software development, and digital media studio. These types of facilities also allow students to use

theoretical knowledge in real-life situations to bridge the gap between knowledge acquired in classrooms and the life of entrepreneurship. An example of this is an engineering student is able to create and design a wearable device; a business student is able to go to the library to conduct market research. Makerspaces are also known to fail to stimulate multidisciplinary collaboration (students of various academic backgrounds coming together to co-create) and hence facilitate the creation of a culture of invention and creativity.

4. Support for Experiential Learning and Entrepreneurship Programs

Academic libraries most often advance the experiential learning programs like business incubators, accelerator programs and entrepreneurship competitions. Librarians observe faculty and innovation centers to provide research assistance, curated data and access to specialized software tools needed to develop projects. Incidentally, a university incubator can collaborate with the library to make available to student's market analytics resources, funding databases, and industry research. This assistance enables student entrepreneurs to test their ideas, build business strategies and innovate prototypes using plausible information. Incorporating library services in experiential programs enhances the standards of entrepreneurial learning in universities and makes students fully prepared to face the complexity of starting new businesses.



Figure 4: Digital Repositories and Knowledge Sharing Mechanisms.

5. Digital Repositories and Knowledge Sharing

By keeping digital repositories and platforms of sharing knowledge, libraries promote innovation. These archives contain research output, case studies, dissertations and project reports which are available to the students, faculty and even the outside parties. Through these resources, students can use the experience of previous efforts, identify the gaps in the current solutions, and work on top of the previous innovations. In addition, open-access repositories provide stimuli in terms of cooperation and networking by linking students to global knowledge communities. As an example, the students can study the successful



Figure 5: The Role of Technology Integration and Digital Collaboration Platforms.

7. Integration of Technology and Digital Tools

Digital tools and new technology are used to promote innovation in academic libraries. This includes software of data visualization, statistical analysis software, simulation software, and project management software. Libraries provide students with access to such resources and, thereby, empower them to test complex datasets, model realistic business situations, and assess what is likely to happen. Also, learning management systems and other

cases of startup, copy best practices, and prevent typical mistakes. Peer-to-peer learning is also facilitated by platform of knowledge sharing where the students can post ideas, comment and refine their work in a learned manner.

6. Collaboration and Networking Opportunities

Academic libraries become locations of interaction and networking, which connects students, instructors, experts in the industry, and mentors. Seminars, workshops and networking events are organized by libraries to connect with stakeholders in various fields encouraging the culture of entrepreneurship in the campus. The libraries provide mentorship opportunities to students, expose them to the real-world challenges, and provide them with venture capital information through connections with business schools, technology transfer offices, and industry associations. Such teamwork activities not only enhance entrepreneurial skills, but also an enabling environment in which innovation can take off. As an illustration, hackathons or innovation competitions in libraries enable students to address real-world issues, receive feedback on these issues, and generate viable solutions within a constrained time.

digital collaboration platforms run by libraries will allow achieving smooth communication, sharing of resources, and tracking of projects among groups of students. The use of technology will ensure that students develop digital skills in addition to entrepreneurial skills that are important in the current technology-based innovation environment.

8. Promoting Interdisciplinary Learning

Entrepreneurship and innovation usually entail

disciplinary skills, including those of technology, business, social sciences, and even design. Academic libraries facilitate interdisciplinary learning by developing collections of materials that cross both many fields, offer research orientation in many disciplines, and creating spaces that encourage cross-functional interaction. Libraries contribute

to a well-rounded innovator because they can assist students in incorporating various viewpoints, which can be used to solve challenging issues in society. An example of such an initiative could be one where a library supports data science, business modeling, and social impact assessment to create a sustainable solution of a startup.



Figure 6: Core Dimensions of an Institutional Innovation Culture.

9. Enhancing Institutional Innovation Culture

The library services are used to develop an institutional culture of innovation and entrepreneurship. Institutions promote the importance of knowledge-based entrepreneurship by integrating the value of library services in the curriculum, extracurricular activities, and innovations. Libraries are viewed as participants of entrepreneurial ventures by students, and not their resource centers. Such culture transformation increased participation among students, promoted creativity, and strengthened the whole innovation culture within the institution. In a nutshell, academic libraries contribute to innovation and entrepreneurial education in a diverse manner. Libraries can be used as sources of entrepreneurial learning and venture creation through access to specialized resources, information literacy and makerspaces, experiential learning, knowledge sharing platforms, networking, technological integration, interdisciplinary learning, and promoting an innovation culture. The applications suggest that academic libraries are not solely support units, but also strategic partners in the creation of the next generation of innovators and entrepreneurs in the higher education sector.

Discussion

Academic library service as a means of promoting innovation and entrepreneurship training proves that they are revolutionary in institutions of higher learning. Libraries used to represent passive repositories of knowledge have evolved to be active catalysts of entrepreneurial learning as well as to the development of campus-wide systems of innovation, as well as to the development of skills. The discussion revolves around the impact of these applications on students, professors, and institutions, points out issues and aspects of greater effectiveness. The magnitude of library services on student learning outcomes is high. The presence of specialized databases, market intelligence, and intellectual property resources allows students to conduct rigorous research, assess the ideas and make a sound business decision. With the integration of information literacy training, the students acquire critical thinking, problem-solving, and analytical skills, which are required in entrepreneurship. Existing makerspaces, innovation laboratories and digital tools improve experiential learning through enabling students to prototype, explore technologies and cross-disciplinary interactions. These opportunities bridge the academic knowledge and real practice and

enhance confidence and entrepreneurial abilities among students. Innovation education is supported by the library to the advantage of the faculty and researchers. Librarians aid in the search of multidisciplinary pieces of literature, evaluation of market trends and utilization of data to pursue research-based entrepreneurial activities. Partnerships between librarians and professors make sure that there is an adequate provision of library resources to be integrated into the entrepreneurial curriculum and project-based learning. This partnership enhances the teaching philosophy of the institution since it integrates evidence-based decision-making and creative problem-solving into the system of education. At the institutional level, library services bring about the spirit of creativity and entrepreneurship. Libraries facilitate multidisciplinary interaction, mentorship and knowledge exchange through the availability of resources, creation of collaborative spaces and networking. Business incubators, innovation challenges, and Hackathons assist libraries in becoming key players in campus innovation communities. Such initiatives help the students to experiment, learn to make mistakes and develop the ideas- all of which are required to achieve long-term entrepreneurial success. Although there are these benefits, there are challenges. Entrepreneurship education can be adversely affected by limited budget and poor staffing and lack of understanding concerning library services. Moreover, the rapidly evolving world of technology requires the staff of libraries to continuously equip their resources, equipment, and skills. These problems should be addressed through institutions by investing in infrastructure, professional growth and strategic alliances with faculty, industry partners and innovation centers. Assessment and effect evaluation is another factor to be considered. Although there are many applications of library services, it is difficult to know their direct impact on the outcomes of entrepreneurship. Measures may be applied by institutions to determine efficacy by using student success rates in startups, research application, engagement in innovation programs, and skill learning. The regular evaluation makes sure that the services of libraries are focused on the goal of the institution, needs of students, and emerging trends in entrepreneurship education. Lastly, the discussion addresses the relevance of the academic libraries in the spirit of the innovation and entrepreneurship education. Libraries enhance the individual and institutional innovation capacity through access to resources, building of skills, learning through experience, and project assignments. Solutions to these

problems and a strict assessment may raise libraries to become more and more drivers of entrepreneurship in higher education.

Conclusion

The academic library services research to facilitate innovation and entrepreneurship training focuses on the role of libraries that are influential and in the development of higher education institutions. The libraries which have been used as the repository of books and academic resources have become dynamic associates encouraging the growth of entrepreneurial thinking, functional skills and innovative abilities among students and employees. The paper has shown that library services go well beyond information delivery, which also involves specialized databases, research support, maker spaces, digital resources and collaborative platforms, all of which can be used to build a powerful entrepreneurship education ecosystem. One of the most important findings is the fact that the accessibility of specialized information sources will promote the ability of the students to make evidence-based decisions to a significant degree. The database of market intelligence, databases of intellectual property, industry research and open-access academic resources allow students to discover opportunities, generate trends and develop viable business solutions. Such resources, as well as information literacy training will equip learners with important research and analysis skills that will prove instrumental in business. Students do not simply learn, they also acquire the ability to negotiate uncertainty well, analyze risks and prove new ideas. Experience learning facilities, including makerspaces, innovation laboratories, and digital studios, improve the performance of library services. Such spaces promote creativity, experimentation, and the use of multiple disciplines to enable students to experiment with their ideas and use theoretical knowledge in practice. Hands-on innovative activities enable students to learn how to solve problems, think creatively, and gain technological abilities, but also how to communicate with other academic fields, which are also essential aspects of entrepreneurship today. Libraries are also involved in the creation of institutional innovation ecosystems. The libraries facilitate networking, mentoring and sharing of knowledge with entrepreneurship programs, business schools, incubators and industry partners. This would foster an overall culture of innovation across campus, involving students and members of the faculty to explore, be involved, and contribute

towards entrepreneurial activities in the campus. Libraries are both intermediaries and facilitators in that they combine knowledge, resources, and human capital to identify innovative solutions. Nonetheless, the report establishes the problems that institutions need to address so that they can maximize library impact. The lack of awareness of services, lack of financing, quick technologies evolution, and the necessity to train staff can all restrict the effectiveness of library contributions. These challenges are related to strategic infrastructure investment, continuing professional growth, and direct engagement of library services in the curriculum and activities of the entrepreneurship field. Moreover, the systematic analysis of the library influence on the entrepreneurial outcomes (measured by parameters student start-up success, participation in the innovation programs, and skill acquisition) may help institutions to improve methods and make sure these approaches correspond to the higher educational goals. Finally, academic libraries have emerged as one of the key drivers to the promotion of innovation and entrepreneurial education. Some of the ways in which libraries empower students and staff are access to the required resources, the sharpening of information and research abilities, hands-on learning, and networking. They do not only replicate the same with their contributions to individual learning but also influence the ability of the institution to be innovative and entrepreneurial. With the recognition and active use of library services potential, higher education institutions are finally going to produce not only a talented and knowledgeable graduate, but one that can transform the economic and societal life, being a creative and an entrepreneur.

Recommendations and Future Research Directions

Considering the analysis of the academic library services in the support of the innovation and entrepreneurship education, multiple recommendations are possible to assist the higher education institutions. It is important to integrate the services of the library with entrepreneurial programs.

- Libraries, research assistance services and digital tools should be included in course design, learning projects based on experience and in startup incubator programs to make sure that students can effectively apply their knowledge to entrepreneurial decision-making. It is vital to invest in infrastructure and technology.

- Libraries should also expand makerspaces, innovation laboratories and digital media by providing these spaces with state-of-the-art equipment like 3D printers, prototyping kits, data analytics programs and simulation tools. That will increase the practical learning opportunities of students and the multidisciplinary cooperation.

Educating Library Workers on their Career:

Library workers should be provided with regular training on entrepreneurship, new technology, and information literacy regarding innovation. This will help them to provide specialized support, guide students and work well with teachers and industrial partners. The culture of innovation can be strengthened through enhancing teamwork and networking. Libraries should collaborate with business schools, incubators, research institutes and other interested parties to conduct workshops, mentoring, hackathons, and networking. Such projects encourage peer-to-peer learning, exposure to industries and practical problem-solving processes. The role of library services on the entrepreneurial result, in the long term, in terms of startup success, innovation output, and skill acquisition, should be explored in the future. International comparative studies would offer best practices, resource consumption pattern, and patterns of successful integrations of libraries and entrepreneurship education. Also, research could examine how digital transformation, artificial intelligence, and virtual collaboration tools affect libraries in making contributions to innovation and entrepreneurship. These recommendations and specific research will enable institutions of higher learning to see the full potential of the academic library as a generator of innovation, and the students will have the skills, knowledge, and resources necessary to become entrepreneurial and transform their communities.

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