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21st-Century Multidisciplinary Collaboration in Research in Library

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Abstract

Multidisciplinary collaboration is the hallmark of research in 21st century. Several academic disciplines or professional specialisations can now come together in an approach to solve a problem. Nowadays, most research projects are multifaceted and multidisciplinary, necessitating diverse and various set of expertise, knowledge, and backgrounds to bring about accomplishments. Digital humanity is a typical example of 21st-century multidisciplinary collaboration. Experts and scholars come together to research case studies and knowledge of various fields of study are employed to achieve a common goal. The approach to multidisciplinary collaboration is evident in all fields such as health and medical practices, financial forensics, criminal investigations, and also in libraries, information centres, archives as well as in museums. Emerging technology has made it possible for experts and scholars from different fields around the world to collaborate on projects and researches without being at the same location. Multidisciplinary collaboration results in the development of global best practices. This paper discusses the functions of multidisciplinary collaboration across disciplines, its impacts, and the opportunities. Conclusions was made on the application in modern libraries and how multidisciplinary collaboration can help achieve library goals and objectives as well as better serve their user community.

Keywords: Collaboration; Multidisciplinary; 21st Century; Library; Information Science

Introduction

In recent years, there is growing demand for researchers in various disciplines to embrace and utilise multidisciplinary collaboration approaches to problem solving. Collaboration is the set of skills that enable people to collectively set goals, allocate resources, fulfil group roles, plan, manage time, make group decisions, negotiate, resolve conflicts, and build teams. Collaborating with other disciplines require researchers to communicate with other individuals, integrate disciplinary perspectives, identify common goals, define workflow, leverage diversity and resolve conflicts in a professional manner. According to Merriam-Webster Dictionary (2021) multidisciplinary is combining or involving several academic disciplines or professional specialisations in an approach to a topic or problem. Multidisciplinary is the bringing together of tools, viewpoints and understandings of two or more disciplines (Dhadphale & Baughman, 2018).

Multidisciplinary approaches involve drawing appropriately from multiple disciplines to redefine problems outside of normal boundaries and arrive at solutions based on a new understanding of complex situations. Multidisciplinary can also be defined as a particular relationship existing between disciplines or collaboration of a few disciplines around the joint theme. Therefore, it is where two or more academic disciplines collaborate for a specific purpose, for instance, when computer scientists, psychologists and sociologists cooperate in the design of human/computer interfaces, use of skills and knowledge from the disciplines mentioned. Multidisciplinary is very imperative in the creation of not only computer science, but almost all disciplines. Even though all disciplines remain divergent, the differences between the disciplines can be quite subtle (Imam & Anuye, 2020).

Multidisciplinary collaboration is an approach that thoughtfully incorporates and connects key concepts and skills from many disciplines into the presentation of a single unit. It helps researchers to connect and use information that they have learned from one discipline to address a problem or work on a project. Multidisciplinary collaboration is a critical component that fosters innovation because the fact that the different disciplines borrow knowledge from each other potentially makes the research work amusing and thought provoking. Multidisciplinary collaboration provides researchers with a more comprehensive learning and researching process that is rich and interesting. The use of the multidisciplinary approach permits the researchers to combine a variety of methods, techniques and technological devices. (Adeyemi, 2010). Successful approaches to global challenges such as climate change, complex biomedical research questions, food shortages, and sustainable

energy use increasingly necessitate the use of multidisciplinary collaboration in research. Diverse collaborative teams are able to bring more innovative solutions to the research effort, maximise breakthroughs while minimising failures, and optimise dissemination of gained knowledge in a broad and efficient manner (Disis & Slattery 2010).

Multidisciplinary collaboration is very vital in the 21st century era this is because of the belief that the global world is a culturally and linguistically diverse entity that can best be understood in an integrated way. It enables scholars and researchers to recognise contrasting perspectives, synthesise, think critically, and re-examine the world and opportunities it affords (Adeyemi, 2010). Multidisciplinary collaboration, which can range from simple or informal to more formal approaches, has been highlighted as necessary, desirable, inevitable, and a key initiative and strategic management to cope with changes and challenges in the digital world (Sacchanand, 2012). According to Zhuravlova (2019) multidisciplinary collaboration occurs in the search for a combination of not only similar subject areas, but also those that have no similarity, however, are essential for the knowledge and understanding of the object being studied. In essence, multidisciplinary collaboration are the method of expert assessments or the method of expert groups whose success is guaranteed by a consensus of opinions based on the results of disciplinary research and a compromise of experts, which is achieved within the limits of the rules of professional and business ethics. Multidisciplinary collaboration allows for studies to consider object or case study which is studied simultaneously from different sides by several scientific disciplines. Each of the disciplines can use its own methodology, its theoretical assumptions, to contribute to the general treasury of knowledge about the object or case study.

Multidisciplinary research involves a harmonised effort that brings together various disciplines to provide complementary contributions in the achieving of a common goal. Multiple perspectives and a broad range of expertise for generating unique and creative solutions are offered by collaborators to solve real-world problems. Conducting multidisciplinary research requires careful consideration of conflicting data collection requirements with the goal of minimising interference across the different measures and judicious prioritisation of research objectives when necessary. Multidisciplinary research requires consideration of the administrative capabilities and constraints of all key stakeholders, including, but not limited to, geographical distribution, funding mechanisms, and organisation-specific policies and resources. Careful planning and regular communications among project team members can help avoid or minimise the effects of

many of these issues (Cuevas, Bolstad, Oberbreckling, LaVoie, Mitchell, Fielder & Foltz, 2012).

As outlined by Akombo (2019), the adoption of multidisciplinary collaboration among various disciplines is important in the following ways: It enables creativity in research, that is, creates the ability to explore diverse fields in our efforts to create historical and new knowledge. Many intellectual, social, economic and political problems require multidisciplinary approach to be solved. It reminds us of the unity that exists among diverse intellectual fields or disciplines. It provides the scholars with the opportunity to delve into other disciplines in the course of his research thereby enabling him/her to appreciate the relevance of other disciplines. It demonstrates or expresses the connection or bond between disciplines, which permits cross border navigation in search for knowledge. It deepens researchers' perspective in learning or research by delving into diverse disciplines in the course of research; and it provides opportunity to scholars to exercise academic or intellectual freedom in the course of research, that is, the freedom to explore other disciplines in the course of research.

The purpose of multidisciplinary collaboration in research is to give a good shape and understanding to the problem or case study being studied. It is a technique that establishes reciprocal relationship among disciplines for better understanding of the problem or case study. This demonstrates the fact that no discipline is independent on its own until it correlates with other subjects. Knowledge is a unity. It is therefore, essential to adopt the multidisciplinary collaboration in order to maintain its- united nature (Zhuravlova, 2019). To engage in multidisciplinary collaborations, researchers have to find collaborators outside of their domain; this is a task harder than finding a collaborator within one's own domain. The personal resources that can be leveraged and the technological tools currently available help to engage in multidisciplinary research. This research explores the possibility of a systematic solution to the problem of finding collaborators in disciplines outside one's own (Wang, Charoenmuang, Knobloch and Tormoehlen, 2020).

In our complex and changing world, success requires that people work together. Multidisciplinary collaboration builds synergy and leads to faster problem-solving. It brings professionals with different skills and expertise together to solve a problem. Bringing a wide variety of team members together, you can broaden the conversation, solve problems and realise faster outcomes. The concentrated effort of many hands and minds is transformative in most organisational applications. Learning ones place in a community of knowledge requires becoming aware of all the knowledge available in other discipline, which makes

multidisciplinary collaboration become more relevant, where skills like empathy and the ability to listen become more valuable to work well with others. In a community of knowledge, an individual is like a single piece in a jigsaw puzzle. Understanding where you fit requires understanding what you know and what others know that you don't. Learning, therefore, isn't just about developing new knowledge and skills. It's also about learning to collaborate with others, recognising what knowledge we have to offer and what gaps we must rely on others to help us fill.

Multidisciplinary Collaboration and Library and Information Science (LIS) Researcher

The global networked society, the convergence of multiple areas of study, and the need to address major challenges that transcend any particular discipline are framing issues for twenty-first century institutions of higher education. Library leaders must seize this exciting opportunity to place the library at the centre of the emerging multidisciplinary collaborations by researching, creating and delivering a transformative suite of programs, services and collections. Libraries can lift their institutions to a higher plane of multidisciplinary collaboration by leveraging their place in higher education to become the hub of multidisciplinary activity, where librarians foster innovative models of teaching, learning, research, conversation, reflection, and engagement.

Information and communication technologies especially internet and social media have revolutionised higher education environment as well as library and information science theory and practice. It is through multidisciplinary collaborative partnership that efficient and effective library and information education programmes and library and information services can be realised successfully. Collaboration between library and information science (LIS) faculty, practicing librarians and other disciplines results in building 21st century professional skills in the researcher, librarians as well as quality and meaningful professional education (Sacchanand, 2012).

The global digital revolution has led to an academic transformation, a new teaching/learning environment, online learning environment, quality assurance initiatives and enormous expectations for higher education to deliver programmes and products that match societal needs. The new technological environment creates learning practices, human support and physical environments that support teaching and learning skills; support professional learning communities that enable educators to collaborate, share best practices and integrate skills into classroom practice; allow equitable access to quality learning tools, technologies and resources; and also support expanded community in learning, both face to face and online (Sacchanand, 2012).

Multidisciplinary collaboration is important to the advancement of LIS as a science and a profession. It helps strengthen the ability to achieve the mutual goal of the LIS, library and other disciplines, and the capacity of faculty and librarians to increase the quality of teaching and learning, research that helps library and information services as well as cost advantages in sharing human resources. Fostering a closer collaboration between librarian, library educators and academics or professional from other disciplines through a variety of activities can help ensure that library education meets the need of the profession (Sacchanand, 2012).

Developing effective forms of multidisciplinary collaboration has become essential for universities dealing with the challenges of complex, dynamic environments. Within the tertiary education sector, collaborative endeavours within various disciplines have been imperative in tackling issues associated with the growing number and diversity of students, reduced government support for research and the consequent intensifying competition for limited resources, mounting emphasis on quality assurance and measurement of outcomes in education and research, shifts in learning paradigm, demand for flexible modes of delivery facilitated by modern technology and the proliferation of educational resources and resource formats (Pham & Tanner, 2015).

Recent years have seen an increase in the level at which librarians participate on collaborative teams outside the library. Librarians are playing emerging roles in the support of research in sciences, medical information sciences, technology, social sciences, arts and humanities as well as data management initiatives (García-Milian, Norton, Auten, Davis, Holmes, Johnson & Tennant, 2013). Librarians have long been interested in how to build trust and multidisciplinary collaborative opportunities with faculty, including recognising factors that inhibit these relationships among various academia. Collaboration with others in their profession will help to be able to keep up with trending developments and deliver international standards in teaching, research and delivery of efficient library information services. Wishkoski, Lundstrom and Davis (2018) averred that networked environment lends itself to cooperation and the sharing of ideas and solutions to problems common to libraries no matter where they are located.

Digital humanities and research in the application of artificial intelligence in libraries have created opportunities for multidisciplinary collaborations in library and information centres. Librarians collaborate with experts from computer science, data science, geographic information science among others. Multidisciplinary collaborations are valuable opportunities for librarians to demonstrate the value of library information professionals to faculty

colleagues in other disciplines and to join patrons more fully in their research projects. Traditionally, librarians have adopted supportive roles in their research collaborations with faculty. While such roles still exist within academic librarianship, there is an increasing emphasis on librarians as partners within research collaborations. These partnerships include grants, systematic review publications, and other projects that benefit from librarians' specialised skillsets (Brandenburg, Cordell, Joque, MacEachern and Song, 2017).

Librarians are often considered support personnel rather than primary collaborators; librarians can and should be primary collaborators, as they can play valuable roles in research projects. As skilled searchers, librarians are often partners for projects that involve searching, such as systematic reviews. Having a librarian on the team ensures an accurate, efficient, and comprehensive search. Many librarians seek and deserve authorship for their expert searching role because of the necessary time commitment and the significant intellectual and methodological contributions they can make to a project (Brandenburg, Cordell, Joque, MacEachern and Song, 2017). Regardless of the project, librarians are often equipped to take on more than searching responsibilities, instead providing valuable input in project planning and discussion, librarians' project management skills ensure successful outcomes. Collaborators are becoming to understand that librarians' engagement leads to positive outcomes. Brandenburg, Cordell, Joque, MacEachern and Song, (2017) noted that scholars encouraged their colleagues and collaborate with librarians in the future.

Pham and Tanner (2015) opined that for effective collaborative partnerships between LIS practitioners and researchers from other discipline; they must develop a personal relationship of mutual understanding and trust that must be nurtured through on-going communication; characterised by respect for each other's knowledge, skills and expertise – recognising the other profession as an equal partner, with different but complementary skills. They must recognise and address power asymmetries between professional groups that are associated with distinct professional traditions, roles and cultures, shifting access to resources and rules and structures that enable or constrain action. Selection of only competent individuals who have well developed interpersonal skills and personalities that mesh well together, and choice of a subset of subjects/curriculum areas with the greatest potential for successful outcomes; and they must focus on exploring together other areas of activity that will add value to the educational or research experience, e.g. supporting the implementation of a new technology or educational framework, research data management and research support for scholarly publishing.

Elements of Multidisciplinary Collaboration

Necessary elements most frequently mentioned throughout the literature include effective communication across the team, leadership and managerial skills, an environment of trust among team members, shared expectations, and clearly defined roles and responsibilities.

Communication

Communication issues are inevitable in multidisciplinary collaborations. Collaborators are to prepare ahead for regular meetings and employ a variety of communication venues (e.g., teleconferencing, wikis, e-mail), while maintaining a willingness to remain flexible and try new approaches. Dhadphale and Baughman (2018) noted that scholars highlighted communication as the most important aspect of successful multidisciplinary collaboration. The logistical aspect of communication included using efficient communication tools such as Google docs, group chats, social media and other aspects such as scheduling, delegation of task, coordination, leadership, and goal setting. This included communication as knowledge integration, developing common jargon, common language, consensus building and developing empathy with other disciplines.

Multidisciplinary projects will involve technology, especially communication or collaboration technologies that are used to help facilitate group-level work, even if they are not as technologically focused project. Librarians should prepare themselves for technical aspects of the project as much as possible ahead of time but keep in mind that technological readiness is not necessarily indicated by an intimate deep technical understanding of the technology; often the willingness to learn and adapt to technology is most important (García-Milian, Norton, Auten, Davis, Holmes, Johnson and Tennant 2013).

Teamwork

Multidisciplinary collaboration is teamwork between more than one professional disciplines. Teamwork include understanding each disciplinary process, boundaries, disciplinary involvement, concentration as well as specialities (Dhadphale and Baughman, 2018). Researchers are now beginning to recognise librarians as their partners in the research process; it becomes very important for librarians to become accustomed to potentially different teamwork styles. Roles and responsibilities for team members should be clearly

defined at the outset of the project in order to ensure that everyone on the team meets expectations. When roles, responsibilities, or project goals change, leaders should communicate those changes and accompanying changes in expectations to the team. Leaders emerge naturally especially the originator of the research idea. Leaders on multidisciplinary projects bear great responsibilities, both in terms of motivating the team and in ensuring task and project completion (García-Milian, Norton, Auten, Davis, Holmes, Johnson and Tennant 2013). On-going evaluation and assessment is needed to garner success and value for all members of the team. Teamwork includes knowledge sharing, finding a common ground, outlining group expectations, and setting clear goals. Teamwork as a concept was prominently cross-linked to communication and conflict.

Conflict

Conflict is unavoidable in big collective tasks and must be critically looked into to guarantee team efficiency. Differences of opinion or ideas form positive conflict which helps and can also benefit teams, as it can generate innovative and ingenious ideas (García-Milian, Norton, Auten, Davis, Holmes, Johnson and Tennant 2013). Conflict can be either individual conflict or group conflict. Individual conflict includes crucial aspects such as biases, expectations, motivation to collaborate, excessive ego and appreciation of cross-disciplinary knowledge. This reflected scholars' individual struggles and mindset required to successfully collaborate. Group conflict included overcoming problems, setting common goals, sharing disciplinary jargon and professionally resolving differences. Conflict resolution is easier when there is effective communication and teamwork (Dhadphale and Baughman, 2018).

Diversity

Diversity is the bedrock of multidisciplinary collaboration. Individuals from different disciplines, socio-economic status, educational background, geo-political affiliation etc. collaborate together to achieve a common goal or carry out a project. Diversity can be in various forms such as learning styles, biases, educational background, disciplinary knowledge, diverse viewpoints and different processes. Also, diversity can come in age, gender, culture, race, domain specific perspectives and forms of knowledge specific to disciplines.

Benefits of Multidisciplinary Collaboration

The benefits of multidisciplinary collaboration include

- a. Collaborators have access to large volume of data at little or no special costing.

- b. Extended expertise joined together from several scholars or experts working collectively on a case study or project.
- c. Saves time and cost.
- d. Allows for virtual collaboration, researchers can be in any part of the world in multidisciplinary collaboration.
- e. Multidisciplinary communication brings about best practises.
- f. Collaborators are recognised for their contributions and participation to the research and project results
- g. For librarians, it gives them the opportunity to engage more directly with the community the library serves and improve the visibility of the library, potentially changing users' perceptions of what the library can do.

Challenges in Multidisciplinary Collaboration

Multidisciplinary collaboration is not without its challenges. The challenges collaborating teams encounter include:

1. The main problem in undertaking multidisciplinary research is meeting the challenge of different team members with various plans or goals. Conflict of interest arises as every team members seeks for a goal that will boost his/her image in their discipline.
2. The biggest challenge is that collaborators usually cannot establish a common meeting time to meet. This can be due to time difference or busy schedule of team members.
3. Funding is another major issue for librarianship collaboration. There is little or no research grants for library and information science (LIS) researches which makes it difficult to be a research theme among scholars.
4. Sustaining respectable communication among all team members can be a daunting task and this generates frustrating blockages for gathering of information and making decisions.
5. Scholars and expert from other disciplines do not see librarians as collaborators but rather than as part of a support system for research work.

Conclusion

The new information climate and quick changing world of information have consequences on swift transformation in library and information theory and practice and in the organisation of library and information science education and provision of library information resources and services. Therefore, library and information science practitioners

must embrace multidisciplinary collaboration so as to provide effective and efficient library information resources and service to library users in this 21st century climate.

Recommendations

For successful achievement for any multidisciplinary collaboration, the following recommendations are hereby made:

1. Challenges in multidisciplinary can be solved through all-encompassing research focus, robust communication plan and schedule, members determination to overcome difficulties, enthusiasm and capacity to adjust, and proper leadership skills.
2. To avert the issue on conflict of interest, a systematic procedure should be established to develop the primary goal which can be objectively agreed upon by all members of the team while still allowing team members to determine their specific research objectives and carefully prioritise meeting the primary goal.
3. Members should establish a central convenient time the very beginning of the project.
4. Government and other bodies should invest in research that can improve the library and provision of information services thereby fostering collaborations with other disciplines.
5. Librarians should be seen as collaborators with equal standing among other faculty rather than as part of a support system for research work.

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