

Breaking Down Disciplinary Barriers: The Power of Multidisciplinary Research in the Globalised World

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Abstract

In the globalised world, complex challenges require innovative approaches that transcend disciplinary boundaries. Multidisciplinary research, which brings together expertise from different academic disciplines, has emerged as a powerful tool to address these challenges. This paper explores the historical context, characteristics, benefits, examples, challenges, and barriers of multidisciplinary research, and highlights its value in addressing complex global challenges. The paper begins with a definition of multidisciplinary research and explains how globalisation has impacted complex global challenges. The importance of addressing these challenges is emphasized in the context of the age of globalisation. The evolution of disciplinary boundaries and the emergence of multidisciplinary research are discussed, along with early examples of its significance. The paper also highlights the shifting focus towards interdisciplinary and transdisciplinary research, showing the evolution of multidisciplinary approaches. The key characteristics of multidisciplinary research are explained, and the benefits of such research are discussed, including the comprehensive understanding of complex problems, creative problem-solving and innovation, and practical applications with real-world impact. The paper provides examples of multidisciplinary research in various fields such as climate change and environmental science, health care, urban planning, artificial intelligence, and conservation biology. Specific examples and impacts of multidisciplinary research in these fields are highlighted, demonstrating its value and potential. Challenges and barriers associated with multidisciplinary research, such as communication barriers, conflicts of interest, and funding limitations, are discussed. The paper explores ways to overcome these challenges and promote effective multidisciplinary research. Finally, the paper summarizes the value of multidisciplinary research in the age of globalisation and emphasizes the importance of promoting and supporting multidisciplinary research.

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Introduction

Multidisciplinary research refers to an approach where researchers from diverse disciplines come together to collaboratively investigate complex problems or challenges. It involves integrating knowledge and expertise from different fields, such as natural sciences, social sciences, humanities, and engineering, to gain a more comprehensive understanding of multifaceted issues. Multidisciplinary research recognizes that many real-world problems are interconnected and require an interdisciplinary approach to generate innovative and holistic solutions.

Globalisation is the process of increasing interconnectedness and interdependence among countries and societies on a global scale. It has transformed the world into a highly interconnected and complex system, where local and global issues are intertwined. Globalisation has significant impacts on complex global challenges, such as climate change, poverty, inequality, infectious diseases, and migration. These challenges are often multifaceted, transcending national borders and requiring coordinated efforts at the global level for effective solutions.

Addressing complex challenges in the age of globalisation is of utmost importance. These challenges pose significant threats to the sustainability and well-being of humanity and the planet. The interconnected nature of global challenges necessitates a multidimensional approach that considers diverse perspectives and expertise from different fields. Sometimes disciplinary approach may not adequately capture the complexity and interrelatedness of these challenges. Multidisciplinary research plays a critical role in addressing complex challenges in the age of globalisation as it promotes cross-disciplinary collaboration, encourages innovative thinking, and generates integrated solutions that are more likely to be effective and sustainable.

Moreover, addressing complex challenges in the age of globalisation is essential for the advancement of society and the well-being of future generations. It requires collaborative efforts among governments, organizations, researchers, and individuals from different

countries and disciplines to work together towards common goals. Global challenges such as climate change, poverty, and pandemics are interlinked and cannot be solved in isolation. By addressing these challenges in a multidisciplinary manner, we can leverage diverse expertise, knowledge, and perspectives to develop more comprehensive and effective strategies that can have a positive and lasting impact on a global scale.

The paper aims to highlight the importance of multidisciplinary research in addressing complex global challenges heightened by globalization. It outlines the historical evolution from rigid disciplinary boundaries to the emergence of collaborative multidisciplinary approaches, transitioning towards interdisciplinary and trans disciplinary research methodologies. Additionally, it emphasizes the essential characteristics and benefits of multidisciplinary research, showcasing its collaborative nature, creative problem-solving, and generation of impactful outcomes across various fields. The paper also presents examples of multidisciplinary research in diverse areas and addresses the challenges faced, proposing strategies to foster an inclusive research culture for more effective problem-solving. Overall, its primary objective is to underscore the pivotal role of multidisciplinary research in addressing intricate global issues by promoting collaborative, innovative, and integrated approaches.

Historical Context of Multidisciplinary Research

Evolution of Disciplinary Boundaries and Emergence of Multidisciplinary Research

The evolution of disciplinary boundaries has witnessed a transformative shift towards the emergence of multidisciplinary research. In the past, research was typically conducted within rigid disciplinary silos, with limited cross-pollination of ideas and methodologies. However, with the recognition that many real-world challenges are complex and interconnected, there has been a growing emphasis on collaboration and integration of knowledge from diverse fields. This has led to the evolution of disciplinary boundaries, with researchers increasingly adopting multidimensional approaches that transcend traditional disciplinary boundaries.

Multidisciplinary research brings together experts from different fields to collaborate, share perspectives, and jointly investigate complex problems. This approach allows for the

integration of diverse knowledge, methodologies, and perspectives, resulting in more comprehensive and innovative solutions to multifaceted challenges. By leveraging the strengths of multiple disciplines, multidisciplinary research has the potential to generate holistic and impactful outcomes that can address complex problems more effectively. The emergence of multidisciplinary research represents a paradigm shift in the way research is conducted, fostering interdisciplinary collaboration and driving innovation in tackling complex challenges facing society today.

Early Examples of Multidisciplinary Research and its Significance

Early examples of multidisciplinary research can be traced back to pioneering efforts in fields such as bioinformatics, environmental studies, and cognitive sciences, where researchers from diverse disciplines collaborated to address complex problems. These early examples highlighted the significance of bringing together different areas of expertise to tackle complex challenges that cannot be adequately addressed within the confines of a single discipline. Multidisciplinary research has shown promise in generating innovative solutions, expanding the boundaries of knowledge, and addressing real-world problems with greater depth and complexity. It has paved the way for a more collaborative and integrative approach to research, driving advancements and breakthroughs in various fields and demonstrating the value of interdisciplinary collaboration in addressing complex challenges in a rapidly changing world.

Shifting Focus towards Interdisciplinary and Transdisciplinary Research

In recent years, there has been a noticeable shift towards interdisciplinary and transdisciplinary research, marking a departure from traditional disciplinary boundaries. Interdisciplinary research involves collaboration between researchers from different disciplines, bringing together diverse perspectives, methodologies, and approaches to address complex problems. Transdisciplinary research goes even beyond disciplinary boundaries, involving engagement with stakeholders from outside academia, such as policymakers, industry, and community members. This shift towards interdisciplinary and trans disciplinary research reflects the growing recognition that many of the challenges facing society today require a holistic and integrated approach that transcends disciplinary silos. By leveraging the strengths of multiple disciplines and engaging with stakeholders from different sectors, interdisciplinary and transdisciplinary research has the potential to generate innovative

solutions that can have a broader societal impact, driving advancements in various fields and addressing real-world problems in a more comprehensive and sustainable manner.

Characteristics and Benefits of Multidisciplinary Research

Key Characteristics of Multidisciplinary Research

Multidisciplinary research is characterized by several key features that distinguish it from traditional disciplinary research. Firstly, it involves collaboration between researchers from different disciplines, bringing together diverse expertise, perspectives, and methodologies to address complex problems. This interdisciplinary approach allows for a broader understanding of the research problem and facilitates the synthesis of knowledge from different fields. Secondly, multidisciplinary research often requires effective communication and collaboration among researchers from different disciplines, as they may use different jargon, terminologies, and research methods. This necessitates interdisciplinary dialogue and mutual understanding to bridge the gaps between disciplines. Thirdly, multidisciplinary research promotes creativity and innovation, as it encourages researchers to think beyond the boundaries of their own disciplines and to explore new ways of approaching research problems. This can lead to the development of novel methodologies, theories, and applications that may not have been possible within a single discipline. Lastly, multidisciplinary research emphasizes the importance of integrating diverse perspectives, methodologies, and findings to generate holistic and comprehensive solutions to complex challenges. This integrative approach allows for a more robust and nuanced understanding of complex problems, and the development of sustainable and effective solutions that can have a broader societal impact.

Overall, the key characteristics of multidisciplinary research include interdisciplinary collaboration, effective communication, creativity and innovation, and integrative approaches, which collectively contribute to addressing complex problems in a more holistic and impactful manner.

Benefits of Multidisciplinary Research

Multidisciplinary research offers several benefits, including a comprehensive understanding of complex problems and creative problem-solving and innovation.

Firstly, multidisciplinary research allows for a comprehensive understanding of complex problems by bringing together diverse expertise from different disciplines. Complex problems often require a multifaceted approach that considers various aspects, and multidisciplinary research enables a holistic perspective. By integrating knowledge and methodologies from different fields, researchers can gain a deeper and more comprehensive understanding of the problem at hand, leading to more informed and effective solutions. Secondly, multidisciplinary research fosters creative problem-solving and innovation. When researchers from different disciplines collaborate, they bring unique perspectives, approaches, and ideas to the table. This cross-pollination of ideas can spark creativity and innovation, leading to the development of novel methodologies, theories, and applications. The combination of diverse expertise and perspectives can lead to innovative solutions that may not have been possible within a single disciplinary approach.

Furthermore, multidisciplinary research can lead to breakthroughs and advancements in various fields by promoting collaboration, encouraging interdisciplinary dialogue, and fostering a culture of innovation. It can also enhance the transferability and applicability of research findings to real-world contexts, leading to tangible impacts on society, policy, and practice.

In summary, multidisciplinary research offers the benefits of a comprehensive understanding of complex problems and creative problem-solving and innovation, making it a valuable approach for addressing the multifaceted challenges of today's world.

Examples of Multidisciplinary Research in Different Fields

Multidisciplinary research is a growing trend in various fields, with researchers from different disciplines coming together to address complex challenges. Here are some examples of multidisciplinary research in different fields:

Climate Change and Environmental Science: Climate change is a multifaceted problem that requires expertise from various fields, such as atmospheric science, ecology, economics, and policy. Researchers collaborate to study the impacts of climate change on ecosystems, societies, and economies, develop strategies for mitigation and adaptation, and evaluate policy options.

Health Care: Health care research often involves collaboration between medical professionals, engineers, computer scientists, social scientists, and other disciplines. For example, researchers may work on developing innovative medical technologies, understanding the social determinants of health, and studying the ethical implications of emerging medical technologies.

Urban Planning: Urban planning is an interdisciplinary field that involves expertise from architecture, urban design, transportation, economics, and social sciences. Researchers collaborate to develop sustainable and inclusive urban planning strategies, study the impacts of urbanization on communities and the environment, and evaluate the effectiveness of urban policies.

Artificial Intelligence: Artificial intelligence (AI) research involves expertise from computer science, mathematics, philosophy, and ethics. Researchers collaborate to develop AI algorithms, study the societal impacts of AI technologies, and address ethical and regulatory challenges associated with AI.

Conservation Biology: Conservation biology is an interdisciplinary field that brings together biologists, ecologists, social scientists, and policymakers to address the conservation of biodiversity and natural resources. Researchers collaborate on studying endangered species, developing conservation strategies, and evaluating the effectiveness of conservation policies.

These are just a few examples of the wide-ranging applications of multidisciplinary research in different fields. The integration of diverse expertise and perspectives through multidisciplinary research allows for a more comprehensive understanding of complex problems and can lead to innovative solutions that have a broader societal impact.

Challenges and Barriers of Multidisciplinary Research

Multidisciplinary research can face challenges and barriers that can hinder effective collaboration and hinder progress. Some of these challenges include communication barriers and differences in language and jargon, conflicts of interest and diverging perspectives, as well as funding limitations and institutional support.

Communication barriers can arise when researchers from different disciplines use specialized terminology and jargon that may not be easily understood by colleagues from other fields. This can result in misunderstandings, misinterpretations, and difficulties in

effective communication and collaboration. Conflicts of interest and diverging perspectives can also pose challenges in multidisciplinary research. Researchers may have different priorities, perspectives, and approaches based on their disciplinary backgrounds, leading to disagreements and conflicts that can impede progress and collaboration. Funding limitations and institutional support can also be challenges in multidisciplinary research. Securing funding for interdisciplinary projects can be challenging due to the traditional funding structures that are often discipline-specific. Moreover, institutional support may vary, with some institutions having established structures and policies to facilitate interdisciplinary research, while others may lack the necessary infrastructure or incentives.

To overcome these challenges and promote effective multidisciplinary research, various strategies can be employed. These may include fostering effective communication through clear and inclusive language, promoting interdisciplinary training and education, establishing collaborative platforms and forums for interdisciplinary exchange, developing policies that incentivize and support multidisciplinary research, and building interdisciplinary research teams with diverse expertise and perspectives.

Additionally, creating a collaborative and inclusive research culture that values diverse perspectives, encourages open and constructive discussions, and promotes mutual respect among researchers from different disciplines can also foster effective multidisciplinary research. By addressing these challenges and promoting a collaborative and inclusive approach, multidisciplinary research can overcome barriers and achieve innovative and impactful results that can address complex problems and advance knowledge in various fields.

Conclusion

Multidisciplinary research is an approach that brings together researchers from diverse disciplines to collaboratively investigate complex problems or challenges. This paper discusses the importance of multidisciplinary research in addressing complex global challenges in the age of globalisation. It highlights that many real-world problems are interconnected and require an interdisciplinary approach to generate innovative and holistic solutions. The paper traces the historical context of multidisciplinary research, noting that there has been a shift towards collaboration and integration of knowledge from diverse fields,

leading to the emergence of multidisciplinary research as a paradigm shift in the way research is conducted. The paper also discusses the shift towards interdisciplinary and transdisciplinary research, involving collaboration between researchers from different disciplines and engagement with stakeholders outside academia.

The characteristics and benefits of multidisciplinary research are outlined, including the collaboration between researchers from different disciplines, effective communication and collaboration, and the synthesis of knowledge from diverse fields. The benefits of multidisciplinary research are highlighted, including the generation of comprehensive and innovative solutions, expansion of knowledge boundaries, and addressing real-world problems with greater depth and complexity.

The paper concludes by emphasizing the importance of multidisciplinary research in addressing global challenges, promoting cross-disciplinary collaboration, encouraging innovative thinking, and generating integrated solutions that are more likely to be effective and sustainable. It highlights that addressing complex challenges in the age of globalisation is essential for the advancement of society and the well-being of future generations, and multidisciplinary research plays a critical role in driving advancements and breakthroughs in various fields and addressing real-world problems in a more comprehensive and sustainable manner.

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