Interdisciplinary collaboration needs to overcome internal academic resistance

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In recent years, the academic community has gradually reached a consensus on the necessity and importance of interdisciplinary cooperation. In the field of humanities and social sciences, the development momentum of interdisciplinary cooperation is particularly significant, and people continue to make innovative breakthroughs in paradigms, theories and knowledge. This trend not only reflects the inherent needs of academic exploration, but also responds to the call for comprehensive solutions in the real world. Although the interdisciplinary model is widely believed to be beneficial to both science and society, scholars have encountered many difficulties in actual operation. Communication barriers between disciplines, differences in research methods and theoretical systems, the shackles of the academic evaluation system, the single path of career development, and the marketization trend of higher education in the West have made it difficult to promote interdisciplinary research in depth. In response to these issues, this reporter interviewed Yvan I. Russell, senior lecturer in psychology at Middlesex University in the UK, Melissa Terras, professor of digital cultural heritage at

Interdisciplinary collaboration needs to overcome internal academic resistance

Management at Peking University. The three scholars agreed that only by deepening reforms in the scientific research system, evaluation mechanism, skills training and funding, can interdisciplinary research in the humanities and social sciences provide strong support for solving the complex problems of today's society and make greater contributions to human prosperity and development.

Professional barriers affect the quality of interdisciplinary research

The openness of a discipline is closely related to its enthusiasm for promoting interdisciplinary cooperation. Russell said that the scope of psychology research is very broad, so psychologists often seek to collaborate with researchers from other disciplines. For example, psychologists studying artificial intelligence may seek the support of computer scientists to achieve tasks that one person cannot accomplish alone by deeply combining knowledge in their respective fields. Russell witnessed psychologists working closely with experts from many disciplines in his academic career, including biologists, neuroscientists, philosophers, linguists, anthropologists, sociologists, medical researchers, and primatology researchers. Although most psychologists show great interest in the possibilities brought by interdisciplinary cooperation, in practice most psychologists collaborate with psychologists. This is because when both parties are experts in the same field, they can discover and correct each other's mistakes, which helps to ensure the quality and effectiveness of the cooperation. However, in interdisciplinary cooperation, the quality and effectiveness of cooperation are often more difficult to guarantee because one party may lack sufficient expertise to identify the mistakes of the other party.

At the same time, it is imperative to break down professional barriers. Mahoney gave an example that digital humanities research projects cannot be separated from interdisciplinary collaboration, because no one researcher can master all the necessary skills alone. The uniqueness of digital humanities lies in the fact that its

Interdisciplinary collaboration needs to overcome internal academic resistance

consistent with their research agendas. Both parties cooperate on an equal footing and benefit each other, rather than one party "serving" the other. This partnership provides opportunities to advance the research agendas of both fields. Truss said that digital cultural heritage involves collaboration across multiple disciplines. Image scientists, information scientists, linguists, historians, natural language processing experts, visualization experts, and a series of professional and technical personnel work together to provide comprehensive support for data collection, analysis and sharing of digital records.

High-quality interdisciplinary collaboration promotes social progress

Many scholars have a positive attitude towards interdisciplinary research, believing that it "opens the door to innovative possibilities", especially in addressing major global challenges. Russell believes that climate change is a typical example, and the only way to solve this problem is through interdisciplinary collaboration. The physical impact of climate change obviously requires natural science researchers to measure, but it also requires scholars in fields such as psychology, sociology, political science, and anthropology to help people understand related issues. For example, why some people are resistant to taking collaborative action to save the earth.

Russell emphasized that interdisciplinary research must be conducted in the right way to ensure quality and efficiency. In his paper "Three Problems of Interdisciplinarity", he elaborated on three key reasons for the failure of interdisciplinary cooperation. First, each field requires in-depth expertise. If interdisciplinary partners do not understand each other's fields well enough, hidden barriers will arise. Second, because there are many unspoken "rules" in various fields, the possibility of miscommunication and misunderstanding is very high. And interdisciplinary partners may not realize the huge differences between them. A common misconception is to confuse IQ with expertise. Researchers with high IQs do not mean that interdisciplinary cooperation can proceed

Interdisciplinary collaboration needs to overcome internal academic resistance

Third, each researcher has his or her own career goals. If the rewards of interdisciplinary research only flow to one party, the other party will be dissatisfied, and the cooperation is likely to end. Therefore, while providing opportunities for interdisciplinary researchers, higher education institutions must also build a system that can support their long-term successful development. Currently, career success and promotion paths in universities are often of a single discipline. Mahoney also said that institutionalized work practices in universities often bring obstacles to interdisciplinary research in terms of personnel, management, and funding rather than support. This has led to interdisciplinary research, which should be at the center of academia, often being on the margins, and interdisciplinary researchers often feel like outsiders in their own professions and departments.

In Mahoney's view, digital humanities may not be able to solve complex global problems, but cooperation, learning and knowledge sharing across national and cultural boundaries can help overcome obstacles and achieve harmonious coexistence between different civilizations and greater prosperity for all mankind. The humanities explore what it means to be "human", including human achievements and results, that is, those things that give value to life, whether it is art, history, music, literature, philosophy or other aspects. The research objects of the humanities include the entire human history from prehistoric times to the present, and continue to extend into the future. Digital humanities apply the most advanced computing technology and methods to humanities data, enabling researchers to examine traditional problems from a new perspective and raise unprecedented and more profound new questions. Although there are challenges at the institutional and personal levels to further promote interdisciplinary cooperation, which need to be overcome through effective communication and mutual understanding, people should realize that cooperation is the key to enhancing human power and the path to a common prosperous future. In order to promote social progress, people need to reach a consensus on education and communication, which is a key step to achieve the goal. It is true that the

Interdisciplinary collaboration needs to overcome internal academic resistance

understanding of the past. We need to understand how humans have shaped today's world.

Academic "gatekeepers" are becoming obstacles to interdisciplinary collaboration

When talking about the development trend of interdisciplinary research, Truss believes that scientific research funding agencies are increasingly encouraging interdisciplinary research, and the ways to publish interdisciplinary research results are also increasing. Recently, the academic community has reached a consensus on how interdisciplinary research can maintain scientificity and rigor while generating huge application value. Mahoney also said that interdisciplinary cooperation can enhance the value of scientific research. Multidisciplinary expertise and experience input will enhance the academic appeal of scientific research results and make them meaningful on a larger scale.

However, as interdisciplinary research expands to more fields, it encounters resistance within the academic community. As part of the open science agenda, interdisciplinary collaboration accelerates knowledge production. For those who support open science, the public and free dissemination of research materials, basic data, and written results should be the overall goal of scientific research culture; however, this concept is still resisted in some fields. Even if researchers have received corresponding remuneration and research funding often comes from public funds, some research results are still strictly "guarded" as if they have become personal private property. Truss observed that there are still some "gatekeepers" in the academic community. They believe that individual researchers should demonstrate professional knowledge and skills in a specific field to support their career development. This concept or rule often emphasizes depth and professionalism rather than the breadth and comprehensiveness of interdisciplinary studies. Scholars who intend to engage in interdisciplinary collaboration may give up interdisciplinary research for fear of not being recognized or hindering their career

Interdisciplinary collaboration needs to overcome internal academic resistance

obstacles if it wants to gain widespread recognition.

Russell found that existing interdisciplinary research focuses on applied research and neglects basic research, and the specific situation varies from institution to institution. There are many cases in the history of science that show that basic research is very useful. If applied research is likened to drawing a line from home to the supermarket, then basic research is like drawing a map of a city, and the information on the map may play a role in unpredictable ways in the future. Fortunately, basic research funds are still available in the most prestigious scientific research institutions. Russell said that he had done research at the University of Oxford in the UK and the Max Planck Society for the Advancement of Science in Germany, both of which enthusiastically promoted interdisciplinary research to achieve ambitious basic research goals. However, the marketization of higher education has led to an overemphasis on applied research, and universities also pay more attention to applied research projects that can quickly bring market benefits. In the past decade, the British government's policies have forced less prestigious universities to become more like technical colleges, which has hindered basic research in these schools, which is also reflected in the research funding program. In this market-oriented environment, British universities have vigorously promoted interdisciplinary research as an important strategy to pursue applied research goals. Russell told reporters that the term "interdisciplinary" is often just a marketing slogan rather than a reality, because high-quality interdisciplinary research is difficult to achieve.

Interdisciplinary stakeholders should benefit equitably

It is common that different disciplines (the disciplines themselves and their researchers) benefit unevenly from interdisciplinary research. According to Truss, this is because different academic evaluation systems are at work. For example, "pure" computer scientists often like to publish articles related to specific computer science

Interdisciplinary collaboration needs to overcome internal academic resistance

has no obvious benefits for the personal resume and career development of "pure" computer scientists. However, their results have great application value for museums and digital humanities scholars. Therefore, interdisciplinary research projects must find an optimal balance so that both technology research and development and technology application can bring benefits, and those who invest in it can be rewarded.

Mahoney also noted that different disciplines have different standards for recognizing academic contributions, but for scholars in the early stages of their careers, recognition is particularly important for seeking promotion and improving their career resumes. One policy in the digital humanities is to recognize the contributions of all participants in research projects (including students), especially the academic contributions of developers of research tools, online resources, and programmers, whose work is often seen as technical skills rather than an important part of the research process. In Mahoney's view, the development of research tools and online resources should also be regarded as academic contributions and recognized. Even so, participants in interdisciplinary projects do not always receive the same level of recognition in their original disciplines, and the same phenomenon occurs in the application process for academic research funds. People must pay more attention to these issues to ensure that all people who contribute to research receive appropriate recognition and that such recognition helps them gain promotion in their own professional fields.

Russell said that unequal benefits from interdisciplinary research are common because each field has its own unique goals and culture. In the field of psychology, it is very important to publish research results in peer-reviewed academic journals; in the field of computer science, it is also good to publish articles online that have not been peer-reviewed. For example, in 2017, computer scientists at Google introduced a new deep learning architecture "Transformer" in the paper "Attention is All You Need", which is considered a milestone in the field

Interdisciplinary collaboration needs to overcome internal academic resistance

time.

Mahoney added that because each field has its own unique academic goals and academic culture, conflicts in interdisciplinary research may arise in the recognition of research contributions of all parties, publication of results, and academic career advancement channels. For example, humanities scholars need to publish articles in high-quality academic journals, and the ultimate goal is to publish single-author monographs; computer scientists need their articles to be included in conference proceedings, and other types of publications are often of little value to them. When publishing works, the order of author names varies from discipline to discipline. Team research projects in the humanities usually sort authors in alphabetical order; in the field of science and engineering, the first author and the corresponding author are more important. In some regions, the first author is the corresponding author; in other regions, the corresponding author is only responsible for uploading all files and following up the publication process. It can be the first author or the least experienced member of the team, regardless of how much he or she has contributed to the research. Digital humanities research also needs to reach an agreement on the way to publish results (digital publications or paper publications), communication and meeting methods (online or offline). In addition, attention should be paid to the language used in interdisciplinary research. The same term may have different meanings in different disciplinary contexts. Institutional and administrative boundaries and scientific research funding may also cause difficulties for interdisciplinary cooperation. For example, who controls the research funds and where are they stored? To solve these practical problems, members of interdisciplinary research projects need to reach an agreement at the beginning of the project and maintain good communication and effective team management during the cooperation process.

Interdisciplinary collaboration needs to overcome internal academic resistance

cultivate an open mind from an early age, which will help people find and devote themselves to the professional field they really love as soon as possible. The "T-shaped talents" that the British often talk about refer to people who have a core area of expertise (the vertical line of the letter T) and have cross-disciplinary skills. The British education sector has a deep understanding of the many benefits of young people having interdisciplinary skills and has improved the teaching syllabus. For example, students studying engineering and computer science must now take ethics courses to gain a deep understanding of the profound impact of technology on society.

Mahoney agrees that it' s never too early to develop interdisciplinary skills. UCL has some mandatory requirements (as should other universities), including adopting a variety of teaching and assessment modes. One of them requires that every degree project must include a module centered on group work. Although group work is sometimes unpopular with students due to uneven participation and workload, it can develop students' ability to respect team members and to offer and accept criticism. When students recognize that team members from different backgrounds have different views and requirements, they can learn to respect differences and will continue to maintain this attitude in future cross-disciplinary or cross-professional collaborations. Effective communication, enhanced transparency and the establishment of friendly team relationships are crucial to the success of interdisciplinary research and the transition from groups to teams.

Interdisciplinary skills not only promote the flourishing of interdisciplinary research, but are also highly sought after in the job market of the 21st century. This is because the world is witnessing a huge change in the global job market. Employers highly value compound talents who not only have profound attainments in their own professional fields, but also have both technical and business literacy. Interdisciplinary positions require the integration of knowledge, methods and professional skills from multiple disciplines or research fields to deal

Interdisciplinary collaboration needs to overcome internal academic resistance

work trends.

Social Science Recommendations

Interdisciplinary focus on multi-field applications of artificial intelligence

Constructing Contemporary Classical Studies from the Perspective of Multiple Civilizations

Mutual Learning among Civilizations and the Modern Mission of Classical Studies

Classical Studies Should Get Rid of the Fetters of Western Research Paradigms

On the construction of a community with a shared future for mankind from the perspective of Chinese and Greek civilizations