

# Exploration of a Problem-solving Oriented Interdisciplinary Education Collaborative Innovation Model in Universities---Based on the Bass Connection Program at Duke University, USA

Lu Ma

College of Education, China West Normal University, Nanchong, Sichuan, 637009, China

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**Abstract:** The Bass Connection Program of Duke University is used as an example to comprehensively explore the collaborative innovation model of social problem-oriented interdisciplinary education in universities, to explore the origin, development, objectives, philosophy and specific model of the Bass Connection Program to explore the collaborative innovation model of interdisciplinary education in American universities.

**Keywords:** Problem-solving; Bass Connections Program; Collaborative innovation

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Since 1990s, problem-oriented interdisciplinary education research has begun to emerge in universities in various countries due to the increasing complexity of global social problems and the blurring of disciplinary boundaries, and nowadays interdisciplinary education has become a necessary path for Chinese universities to turn to comprehensive development<sup>[1]</sup>. This paper intends to consider the collaborative innovation model of problem-solving-oriented interdisciplinary education in China's universities based on the Bass Connection Program of Duke University.

## 1. Duke University's Bass Connection Program

Duke University is a world-class university with the reputation of "South Harvard" and specializes in interdisciplinary education. The Bass Connection Program, which originated from Duke University, is a trinity of social problem-oriented, interdisciplinary education-based, and collaborative innovation model. The core of the program is the collaborative innovation model on which it is based, which is supported by adequate funding and a well-developed operating system.

### 1.1 The emergence and development of the Bass Connect program

The knowledge or skills needed to solve societal problems are often not fully affiliated with one field, so interdisciplinary education has become one of Duke University's higher education research priorities. The five core themes of the Bass Connections Program were selected: Brain and Society; Education and Human Development; Energy and Environment; Global Health; and Information, Society and Culture. The Bass Connections program creates a unique new model of education based on teamwork and interdisciplinary inquiry that actively engages students in the exploration of critical and unresolved societal issues.

By the end of 2020, a total of 3,741 members at various academic levels had joined 516 Bass Connections year-long project teams and summer research teams in the Duke community. 2019-2020 saw the largest number of participants in the Bass Connections program to date, with team members working together through 68 project studies, 47 summer research projects and 48 affiliate programs. The vast majority of the Bass Connections Program teams have included participants from external organizations or other universities, so a program was launched to expand the Connections model.

### 1.2 Bass Connections Program Philosophy and Goals

The core philosophy of Bass Connections is rooted in the need to address social issues, which was developed when Duke University was renamed from Trinity College. The five thematic projects of the Bass Connections Program are in the areas of education, environment, global health, culture, and so on, to identify and solve social problems. The second is the concept of interdisciplinarity. The program brings together faculty, post-docs, graduate students, undergraduates, and external partners to address complex societal issues in interdisciplinary research teams.

The goals of the Bass Connections Program are articulated at three separate levels: student, faculty, and team. (1) For undergraduate students, the goals of participation in the Bass Connections Program include developing research skills in a group setting, applying coursework to complex societal challenges. (2) Faculty members integrate interdisciplinary education, research, and external activities to explore social and cultural challenges in a particular topic. (3) Support and manage project teams and develop curricular pathways for teams internally and externally. Target student cohesion and develop problem-centered education.

### 1.3 Interdisciplinary Education Collaborative Innovation Model of the Bass Connections Program

Through the Bass Connections Program, Duke has passed on its unique culture of collaboration, ambitious entrepreneurship, and established track record of applying classroom learning to pressing global issues to create a unique new model of education. The team is modeled on three core connections: across disciplinary areas of expertise; across learner levels (undergraduate, master's/professional, doctoral, and medical students); and between the school and the outside world. The core of the connection lies in the collaborative work between faculty and students on campus and external partners on applied interdisciplinary problems. Each Bass Project team typically consists of at least two leaders, at least one of whom must be a faculty member.

Duke faculty participate in the Bass Connections program at all levels, and many faculty members also use the initial findings of their Bass Connections teams to obtain external funding. Graduate and professional students serve on the teams as mentors for the Data+ and Story+ teams under the Bass Connections umbrella, and as faculty teaching assistants who design and deliver Bass Connections courses. Most teams work with community partners outside of Duke, including nonprofits, universities, school systems, hospitals, government agencies, and private companies. In addition to towns in the United States, the Carolinas, and Durham, teams work with 352 partners in 35 countries and territories on five continents<sup>[3]</sup>.

## 2. Thinking about the collaborative innovation model of interdisciplinary education in China's universities under problem-solving orientation

The success of the Bass Connection Program at Duke University in the United States is inevitable, with stable financial guarantee, sound system and perfect operation mechanism supporting its smooth operation. In contrast, China has been in a relatively weak state in the field of interdisciplinary education, the reason for which cannot be separated from the imperfect operation mechanism leading to the difficulty of realizing the integration of industry-university-research<sup>[6]</sup>. The interdisciplinary education model is indispensable for colleges and universities to move towards a comprehensive and application-oriented path.

### 2.1 Integration of interdisciplinary education and curriculum

In the Bass Connect program, Duke University has divided the interdisciplinary education courses into two major categories; first, the interdisciplinary courses are offered in the summer to meet the basic interdisciplinary education of Bass Connect program members; second, the interdisciplinary education courses are set in the semester and integrated with the students' own semester courses. At present, the curriculum of China's colleges and universities is still dominated by the separation of faculties and departments, so the problem of interdisciplinary education should be solved from the curriculum first.

### 2.2 Improving the philosophy and means of education

Innovation is one of the core qualities required of future talents, and the cultivation of innovative talents is one of the basic goals of the Bass Connections Program. Innovation is the basis of concept and collaboration is the basis of practice, and the two are combined into one to establish the talent cultivation pathway in universities. Therefore, universities in China should first establish the concept of innovative talents cultivation and implement this concept in their daily courses and activities, reform the content of difficult and old subjects and integrate new teaching methods to encourage students' innovation, and improve the level of education and service to the society by the mode of collaborative innovation.<sup>[7]</sup>

### 2.3 Implementation of industry-university integration

The Bass Connection Program offers a special collaborative study program for professional students, which requires students to use the academic knowledge and skills developed simultaneously in the curriculum to work in teams on research problems in teams. Students are empowered to apply classroom learning to interdisciplinary challenges and to work effectively in teams, ultimately creating new knowledge or tangible work. Therefore, our universities should fully implement school-university cooperation and school-enterprise cooperation in the process of industry-university-research integration and provide sufficient professional practice opportunities for students to solve actual social problems with what they have learned.

## 3. Conclusion

Duke University's Bass Connection Program provides a more complete experience and framework for the philosophy, concrete practice, and new model of interdisciplinary education in our universities, so we should build our own model of collaborative innovation in interdisciplinary education based on this excellent program combined with the characteristics of our own universities.

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