

Study on the Tripartite Collaborative Training Mechanism for Secondary School Mathematics Teachers



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Abstract: Based on the principle of "local colleges and universities serving the local community", the university has established a tripartite collaborative training mechanism with the local secondary schools and government with clear rights and responsibilities, stable coordination and win-win cooperation. Based on the theoretical teaching and practical guidance of teacher education, and oriented to the improvement of educational and teaching ability, the university is striving to build a cooperative community integrating the training of secondary school mathematics teachers, the training of in-service secondary school mathematics teachers, and the research and service of backbone teacher education.

Keywords: tripartite collaborative; local colleges and universities; secondary school mathematics teachers

1. Preface

Based on the development concept of "student-centred, output-oriented and continuous improvement", the tripartite collaborative cultivation mechanism, and by absorbing the rationalisation suggestions of the three parties, we have constructed a curriculum system that focuses on the formation of students' abilities, and formed a talent cultivation mode that is integrated with "inside and outside the classroom, inside and outside the school". In the process of collaborative education, we focus on shaping the abilities of teacher trainees according to the needs of the society, strengthening the cultivation and training of teacher trainees' ability of expression and communication, teamwork, scientific thinking, innovation and entrepreneurship, practical operation and harmony, so as to equip them with mathematical literacy of discovering, analysing, creating and solving complex problems, and enable them to adapt to the challenges and changes in the

future of educational work.

The tripartite collaborative training mechanism promotes the formation of a community of teachers' professional development. Teachers of the university and secondary school teachers have cooperated in a number of research projects on teaching reforms, which has deepened the understanding of university teachers on basic education, improved secondary school teachers' own teaching and research capabilities and professionalism in education, and formed a community of cooperation with a "two-way", "mutual assistance" and "win-win" approach.

2. The Status of Our School's Collaborative Training Mechanism with Local Education Administrations and Secondary Schools

Yichun University adheres to the mode of education that combines various forms of education, and actively promotes cooperation between colleges and universities, government departments and secondary schools at all levels for education and development. It continues to establish and improve

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the nurturing mechanism of synergy in training objectives, synergy in teaching staff, synergy in resource sharing and synergy in management mechanisms.

Yichun University, Yichun education administrative departments and high-quality primary and secondary schools in and cities have established the U-G-S" (University-Government-Secondary School) collaborative training model, signed the "Agreement on Educational Cooperation between Yichun Municipal Education Bureau and Yichun University", formulated the "Interim Measures for Management of Industry-University Cooperation Collaborative Education Projects of Yichun University" and other related management and training systems, formed a stable collaborative relationship, and set up a platform for the "tripartite collaborative cultivation of excellent teachers among universities, local education authorities and high-quality secondary schools", which combines "research on teacher education, talent cultivation, policy consulting, and social services" and other functions.

In order to promote the good operation of the platform of collaborative education, Yichun University actively joins hands with the practice base to build a "dual-mentor" teaching team with high academic qualifications, reasonable title structure, good teaching skills, strong scientific research ability, high comprehensive quality and rich practical experience. The school has set up a collaborative education practice teaching base office in the Academic Affairs Office, responsible for the coordination, construction and daily operation of the base.

Since 2011, Yichun University has signed practice teaching base agreements with 12 middle schools, including Yichun No. 3 Middle School, Yichun No. 8 Middle School, Yichun Experimental School and Yiyang School, following the principles of "the same concept, the same goal, sharing responsibilities, division of labour, mutual benefit and win-win cooperation, and co-operation and

development", to carry out the training of teacher trainees, training of middle school teachers and research on basic education, so as to jointly promote the construction of the teaching force.

According to the training programme of Mathematics and Applied Mathematics (Teacher Training) of our university, mathematics teacher trainees are required to undergo a two-week teaching apprenticeship in the 2nd, 4th and 6th semesters, and an 18-week educational internship and a two-week educational research in the 7th and 8th semesters. Under the coordination of the Yichun Education Bureau, our mathematics teacher trainees are admitted to the internship bases for internship within a specified period of time every year.

3. Yichun University and Secondary Schools Co-operate to Build a Platform for Teachers' Professional Development and Form a Co-operative Community Integrating Secondary School Teacher Training, Training, Research and Services

Based on the theoretical teaching and practical guidance of teacher education, and oriented to the improvement of educational and teaching competence, Yichun University endeavours to build a cooperative community integrating the training of secondary school mathematics teachers, the training of in-service secondary school mathematics teachers, and the research and service of backbone teacher education (Chen et al., 2018; Fu et al., 2022; Ji et al., 2016; Jiang, 2020; Jiao, 2016; Li, 2017; Liu & Li, 2021; Liu & Xu, 2016; Min, 2018; Tan & Zhao, 2021; Tang, 2017).

3.1. Actively conducting teaching seminars and forming education and teaching research teams

During the educational apprenticeship and internship, our internship supervisors organise relevant teaching and research activities for the secondary school teachers and interns. Teaching and research activities are rich in forms and actively discuss relevant basic education issues, which not only builds up the awareness of primary and secondary school teachers to strengthen their

theoretical learning in education. At the same time, it also enables our interns to understand the importance of combining theory and practice. The collaborative education platform enables most of the secondary schools in and around Yichun City to form a long-term, stable, resource-sharing, complementary, and common development relationship, and builds a solid platform for the professional development of teachers in cooperation with secondary schools.

Secondary school teachers in practice bases participate in educational and teaching research conducted by our basic education teacher team. Teachers of subject pedagogy strengthen their communication with teachers in practice bases in educational practice activities through attachment. For example, a series of mathematics education and teaching researches have been carried out in the training of innovative talents in this discipline, diversified training of students, training of teacher trainees, reform of the curriculum and pedagogy of mathematics education classes, and research on the integration of information technology and mathematics teaching. In the past three years, in order to strengthen the exchange of educational practice with secondary school mathematics teachers, Yichun University has assigned outstanding teachers majoring in Mathematics and Applied Mathematics to Yichun No. 4 Middle School.

3.2. Participation in basic education teacher training services

Under the organisation of Yichun Municipal Bureau of Education and Sports, our teachers actively participated in activities related to basic education teacher training. Among them, some of our teachers participated in Yichun New Teacher Training and Yichun Secondary Mathematics Teacher Continuing Education Training. Some of our teachers participated in the national teacher qualification interview. On the other hand, some of our teachers actively cooperated with secondary school teachers to declare the provincial basic education research projects, which further promoted

the educational research level of secondary school teachers. In addition, some of our teachers participated in the construction of intelligent teaching in secondary schools, assisted secondary schools to develop online guided learning intelligent system, improved the secondary schools' informatisation teaching ability, and gave greater energy to classroom teaching through artificial intelligence technology (Guo, 2017).

3.3. A platform for the exchange of solid mathematical expertise -- Yichun Maths Society

Through the platform of Yichun Mathematical Association, we actively held relevant academic exchange activities, invited relevant experts to give scientific research reports, and invited teachers from various secondary schools in batches to attend the meetings, so as to enhance the professional knowledge of secondary school mathematics teachers. In addition, our institute successfully hosted the annual meeting of Jiangxi Mathematical Society in 2021, which promoted the exchange and learning between our mathematics teachers and their counterparts in the province's sister colleges and universities.

3.4. Development of a platform for teaching skills competitions

Every year, We actively organises teacher-training skills competitions to create a good "teacher-training competition" atmosphere for students. At the same time, the school leads students to participate in various national teacher training competitions. Through the competitions, the school strengthens the characteristics of teacher education, enriches the cultural atmosphere of teacher education, guides teachers and students to take the initiative to serve in the reform and development of basic education, promotes the reform of the school's talent cultivation mode which is oriented to the practical ability, facilitates the professional growth of pre-service teachers by combining the theory and practice, improves students' teaching skills and enhances their competitiveness in employment.

4. Effectiveness of Tripartite Collaborative

Education

Based on the development concept of "student-centered, output-oriented, and continuous improvement", the tripartite collaborative cultivation mechanism absorbs the rationalized suggestions of the three parties, builds a curriculum system with the formation of students' abilities as the core, and forms a talent cultivation mode integrating "inside and outside the classroom, inside and outside the school". The model of talent cultivation is integrated with "inside and outside the classroom, inside and outside the school". In the process of collaborative cultivation, emphasis is placed on shaping the abilities of teacher trainees according to the needs of the society, strengthening the cultivation and training of teacher trainees' ability of expression and communication, teamwork, scientific thinking, innovation and entrepreneurship, practical operation and harmony, so as to equip them with mathematical literacy of discovering, analyzing, creating, and solving complex problems, and to enable them to adapt to the challenges and changes in the future of educational work. The three-party synergistic training mechanism advances the development of teachers.

The tripartite collaborative training mechanism promotes the formation of teachers' professional development community. Teachers of the college and secondary school teachers have cooperated to carry out a number of teaching reform research projects, which deepens the understanding of college physical education teachers on basic education, improves secondary school physical education teachers' teaching and research ability and education professionalism, and forms a "two-way", "mutual help", "mutual education", and "mutual support". It has formed a "two-way", "mutual help" and "win-win" cooperation community.

4.1. Enhanced mathematical literacy of teacher educators

Yichun University has carried out a practical exploration of the cultivation of mathematical literacy among teacher training students, and

gradually formed the "2-3-3" model based on the enhancement of mathematical literacy among college students. In the "2-3-3" model, mathematics teaching practice is an important way to improve the mathematical literacy of teacher training students. Yichun University makes full use of the practice bases to carry out mathematics teaching practice interactions to improve students' mathematical literacy in a planned and gradual manner.

4.2. Improved quality of training for teacher trainees by relying on educational practice bases

(1) High Achievements in Teacher Training Skills Competition. Under the good collaborative training mechanism and through the "dual tutor" system, teacher trainees have achieved a series of fruitful results in competitions on teacher training skills.

(2) Good employment situation for teacher graduates. Through collaborative training, our mathematics teacher training students are relatively excellent in professional quality and teaching ability, etc. In the past five years, the mathematics graduates have passed the recruitment examination of Yichun primary and secondary schools through good teacher training quality, and have been employed in some key secondary schools in Yichun. For example, Yiyang School, Yichun Experimental Middle School, Yichun No.8 Middle School, Yichun Yuanzhou School, Yichun Middle School, etc. The employment industry of the graduates of Mathematics and Applied Mathematics majors from the class of 2017 to 2022 is mainly "Mathematics Teaching Personnel", which accounts for about 90 per cent of the total number of graduates.

(3) Enhanced the level of educational research of our team of educational research teachers. Under the platform of tripartite collaborative education, the teachers of our institute went deep into the first-line teaching practice of secondary schools, and cooperated with secondary school teachers to apply successfully for 14 provincial education reform projects. Combined with educational theories, the research on basic education has been

carried out and certain research results have been achieved, while the basic education research level of teachers in our basic education team has been improved.

5. Conclusion

Based on the principle of "local colleges and universities serving the local community", the university has established a tripartite collaborative training mechanism with the local secondary schools and government with clear rights and responsibilities, stable coordination and win-win cooperation. It has improved the mathematical literacy of our teacher trainees majoring in Mathematics and Applied Mathematics; improved the quality of teacher trainees' training by relying on the educational practice bases; and established friendly and sincere interactive and co-operative relationships with local primary and secondary schools in teaching and research.

Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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