Journal of Education, Teaching and Social Studies
ISSN 2642-2336 (Print) ISSN 2642-2328 (Online)
Vol. 8, No. 1, 2026
www.scholink.org/ojs/index.php/jetss

Original Paper

Research on the Current Employment Situation and Countermeasures for Undergraduate Graduates Majoring in Mathematics and Applied Mathematics

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Abstract

As a foundational discipline in higher education institutions, the employment situation of graduates majoring in Mathematics and Applied Mathematics is increasingly attracting social attention. This paper systematically analyzes the current employment situation and challenges faced by undergraduate graduates majoring in Mathematics and Applied Mathematics. The research shows that graduates of this major have the advantages of broad employment prospects and strong adaptability, mainly flowing into the education industry, financial industry, and IT industry. However, they also face multiple challenges, including the continuously rising number of graduates, prominent structural contradictions between supply and demand, and the impact of artificial intelligence on traditional positions. The main problems include: students' "delayed employment" mentality, vague career cognition and unclear positioning, disconnect between practical abilities and market demand, insufficient job-seeking skills, and lack of interdisciplinary integration ability. In response to the above problems, this paper proposes countermeasures in five aspects: strengthening career planning education, constructing a "Mathematics +" composite talent cultivation system, deepening industry-education integration and school-enterprise cooperation, improving the employment guidance service system, and guiding students to change their employment concepts. The research aims to provide a reference for the reform of mathematics talent cultivation and graduate employment work in universities.

Keywords

Mathematics and Applied Mathematics, Employment Situation, Talent Cultivation, Employment Countermeasures, Composite Talents

1. Introduction

1.1 Research Background

1.1.1 The Overall Situation of Graduate Employment in Higher Education

With the advancement of the massification of higher education, the number of college graduates in China continues to rise. Data from the Ministry of Education shows that the number of general college graduates nationwide in 2025 is expected to exceed 12 million, reaching a record high. While the pressure from the total number of graduates continues to increase, economic restructuring and industrial upgrading have also put forward new requirements for the structure of talent demand. "The coexistence of total volume pressure and structural contradictions" has become the basic situation facing the employment of current college graduates.

At the same time, the rapid development of artificial intelligence technology is reshaping the job market landscape. With the rise of generative AI such as ChatGPT, some traditional positions face the risk of being replaced. For the mathematics major, AI brings both challenges – some routine tasks may be replaced – and opportunities – mathematics, as the underlying language of artificial intelligence, sees a continuous increase in demand for related talents.

1.1.2 The Specificity of the Mathematics and Applied Mathematics Major

Mathematics and Applied Mathematics is a foundational discipline characterized by strong theoretical nature and wide application. This major is committed to cultivating students' solid mathematical theoretical foundation, rigorous logical thinking ability, and ability to use mathematical methods to solve practical problems. This cultivation model gives graduates strong adaptability, enabling them to enter multiple fields such as education, finance, IT, and scientific research; it also faces the awkwardness of "unclear professional advantages" – lacking financial knowledge compared to finance majors, and lacking programming ability compared to computer science majors.

Therefore, the employment problems of Mathematics and Applied Mathematics majors are unique, differing from the "narrow matching, high alignment" of purely applied majors as well as the "broad scope, weak skills" of humanities and social science majors, requiring specialized research.

1.1.3 New Requirements for Employment Work under the New Situation

The Party and the state attach great importance to the employment of college graduates. The report of the 20th National Congress of the Communist Party of China emphasized "implementing the employment priority strategy," placing employment in a priority position in economic and social development. The Ministry of Education clearly stated that universities should implement the "top leader project" for employment, integrating employment work throughout the entire process of talent cultivation. Against this backdrop, the Mathematics and Applied Mathematics major urgently needs to systematically analyze the current employment situation, deeply diagnose existing problems, and scientifically formulate response strategies, organically combining employment work with talent cultivation reform to achieve high-quality and full employment for graduates.

1.2 Research Purpose and Significance

1.2.1 Research Purpose

This study aims to systematically analyze the current employment situation and existing problems of undergraduate graduates majoring in Mathematics and Applied Mathematics, and on this basis, propose targeted countermeasures and suggestions. Specific goals include: First, to describe the main employment destinations and industry distribution of graduates of this major; Second, to diagnose the main problems in current employment and their causes; Third, to propose systematic improvement countermeasures from the two dimensions of cultivation model and employment services.

1.2.2 Theoretical Significance

From a theoretical perspective, this study helps enrich the theoretical understanding of employment issues in foundational disciplines. Mathematics, as a typical non-applied major, its analytical framework for employment issues (such as the "composite talent" cultivation concept) can be extended to other foundational disciplines, providing a reference for related research.

1.2.3 Practical Significance

From a practical perspective, this study can provide a basis for optimizing the talent cultivation programs of university mathematics majors and improving employment guidance work. The countermeasures proposed in the research are highly operable and can be used as a reference for relevant departments.

1.3 Domestic and International Research Status

1.3.1 Domestic Research Status

In recent years, domestic scholars have paid continuous attention to the employment issues of graduates of mathematics majors. Some institutions have conducted employment quality analyses based on their own graduate data. For example, one study took the 2022 graduates of mathematics majors at Yili Normal University as a sample, analyzing aspects such as graduates' employment intentions, self-evaluation of comprehensive quality, employment satisfaction, and salary treatment. The employment quality report for the class of 2024 released by Minnan Normal University showed that graduates majoring in Mathematics and Applied Mathematics mainly flowed into the education industry (306 people), with some entering enterprises and government institutions.

In terms of employment guidance, a study took the Mathematics and Applied Mathematics (Normal) major as an example, exploring how university counselors carry out employment guidance for normal students, emphasizing the importance of strengthening professional skills training and enhancing professional quality. Another study investigated and analyzed the transformation employment tendencies of mathematics normal students in local institutions.

1.3.2 Relevant International Research

International research on the employment of mathematics graduates mainly focuses on the job market and career development paths of STEM talents. Research shows that mathematics graduates have competitive advantages in fields such as finance, technology, and consulting due to their quantitative analysis abilities. In recent years, emerging professions such as "data scientist" and "quantitative analyst"

have become important destinations for mathematics graduates.

1.3.3 Limitations of Existing Research

Taken together, existing research has the following shortcomings: First, most are case studies of single institutions, lacking refinement of common problems; Second, the countermeasure suggestions are relatively general, lacking in-depth discussion from the perspective of cultivation model reform; Third, there is insufficient systematic design for the cultivation of "Mathematics +" composite talents.

1.4 Research Methods and Content Framework

1.4.1 Research Methods

This study primarily adopts the literature research method and comparative analysis method. By systematically reviewing relevant literature and employment reports, the current employment situation and core problems of Mathematics and Applied Mathematics graduates are refined; by comparing employment data from different institutions and different majors, the advantages and shortcomings of this major are analyzed.

1.4.2 Content Framework

This paper is divided into five parts. Part 1 is the introduction, presenting the research background, purpose, significance, and current state. Part 2 analyzes the employment status of graduates majoring in Mathematics and Applied Mathematics. Part 3 diagnoses the main problems in current employment. Part 4 proposes systematic countermeasures and suggestions (five key points). Part 5 is the conclusion and outlook.

2. Analysis of the Current Employment Situation of Undergraduate Graduates Majoring in Mathematics and Applied Mathematics

2.1 Overall Employment Situation

2.1.1 Employment Rate and Employment Quality

In recent years, the overall employment rate of graduates majoring in Mathematics and Applied Mathematics has remained at a relatively high level. Taking the School of Mathematics and Statistics of Minnan Normal University as an example, the overall employment situation of the 2024 graduates was good, with graduates widely distributed in multiple fields such as education, enterprises, and government institutions. In terms of employment form, "employment by signing agreement" is the main form, with some students choosing flexible employment or further study.

In terms of employment quality, graduates of this major show a differentiated pattern in salary levels, career development space, and other aspects. Graduates entering key middle schools, well-known financial institutions, or leading technology companies have higher starting salaries and better development prospects; graduates entering ordinary private schools or small and medium-sized enterprises face problems such as low salaries and limited promotion space.

2.1.2 Industry Distribution

From the perspective of industry distribution, the employment fields of Mathematics and Applied

Mathematics graduates are characterized by diversification. The education industry is the main destination – taking Minnan Normal University as an example, 306 graduates of the class of 2024 chose the education industry, accounting for a considerable proportion of the total employed. Statistics from the Capital University of Economics and Business also show that over 70% of graduates of the Mathematics and Applied Mathematics (Finance Direction) major entered large and medium-sized state-owned enterprises and institutions, internet companies, and banks.

Specifically, the main employment directions of this major include:

① **Education Industry**: Primary and secondary school mathematics teachers, training institution teachers, educational institution research and development personnel, etc.

② **Financial Industry**: Risk management, quantitative analysis, financial analysis positions in banks, securities firms, and insurance companies.

③ **IT Industry**: Data analysis, algorithm engineering, software development, artificial intelligence, etc.

④ **Government and Institutions**: Positions requiring data processing capabilities such as statistical bureaus and tax bureaus.

⑤ **Further Study**: Pursuing graduate studies in mathematics, statistics, finance, computer science, and other directions.

Some universities have pointed out that mathematics, as the underlying language of technological innovation, is ushering in a "golden period" of development, with demand for talents with mathematical backgrounds in fields such as financial risk control and AI algorithms continuing to rise.

2.1.3 Regional Distribution

From the perspective of employment regional distribution, graduates are mainly concentrated in their home provinces and economically developed regions. The report from Minnan Normal University shows that the most graduates of the class of 2024 were employed in Fujian Province (308 people), followed by Guangdong Province, the Guangxi Zhuang Autonomous Region, Guizhou Province, etc. Economically developed regions (Yangtze River Delta, Pearl River Delta, Beijing-Tianjin-Hebei) have stronger appeal to mathematics graduates, with more advantageous salary levels and development space.

2.2 Employment Characteristics of the Normal Direction

2.2.1 Increasingly Fierce Competition for Teaching Positions

The Mathematics and Applied Mathematics (Normal) direction is one of the most important cultivation directions of this major. In recent years, the number of normal university students has increased significantly, and the consequent employment pressure has gradually increased. Specific manifestations include: competition for teacher establishment positions in high-quality urban schools has become white-hot, with some positions having applicant-to-recruit ratios reaching dozens to one; although private schools and training institutions have greater demand, job stability and salary levels vary.

At the same time, with the deepening of education reform, the state has put forward higher requirements for teachers' professional quality and ability. The teacher qualification examination is now a national

unified examination, making the assessment of normal students' professional abilities stricter. This trend forces normal students to improve their professional quality and teaching ability.

2.2.2 Employment Space in Grassroots and Rural Schools

Although competition in urban schools is fierce, grassroots and rural schools still have significant demand for mathematics teachers. Programs such as the "Special Post Plan" and "Three Supports and One Assistance" provide channels for normal students to find employment at the grassroots level. Some local institutions explicitly encourage graduates to serve national strategies and make contributions where the motherland needs them most.

2.3 Employment Characteristics of the Non-Normal Direction

2.3.1 "Mathematics +" Composite Talents in High Demand

With the rapid development of the digital economy and financial technology, composite talents with mathematical backgrounds are increasingly favored by the market. When recruiting, enterprises tend to choose talents with composite backgrounds such as "Mathematics + Computer Science" or "Mathematics + Finance." For the Mathematics and Applied Mathematics (Finance Direction) major at the Capital University of Economics and Business, over 50% of graduates continue their studies in directions such as applied mathematics and financial statistics, entering internet companies like Tencent and Baidu, as well as banks.

This trend puts forward new requirements for the cultivation of mathematics talents: a single knowledge of mathematics is no longer sufficient to meet market demand, and interdisciplinary integration has become an inevitable choice.

2.3.2 Transformation Employment Becoming a New Trend

Some mathematics normal students choose "transformation employment," i.e., entering non-education industries. A study investigating the transformation employment tendencies of mathematics normal students in local institutions found that bank employees, game character designers, psychological counselors, etc., are favored transformation directions. This transformation not only reflects the intensity of competition for teaching positions but also demonstrates that the logical thinking and quantitative abilities cultivated by the mathematics major have cross-domain universal value.

2.4 Further Study Situation

2.4.1 Postgraduate Entrance Examination and Further Study Rate

Further study is an important destination for mathematics graduates. After laying a solid theoretical foundation at the undergraduate level, mathematics students can choose to continue their studies in multiple directions at the graduate level, such as mathematics, statistics, finance, computer science, and data science. The further study rate in some university mathematics programs exceeds 30%, and in key institutions, the further study rate for financial mathematics directions even exceeds 50%.

2.4.2 Cross-disciplinary Postgraduate Entrance Examination Trends

It is worth noting that mathematics students have a relatively high proportion of applying for cross-disciplinary postgraduate studies. Master's degrees in Finance, Applied Statistics, Computer Science, etc.,

have become popular choices. This cross-disciplinary further study path helps students build a composite knowledge structure of "Mathematics + X," enhancing their employment competitiveness.

3. Main Existing Problems in the Employment of Graduates Majoring in Mathematics and Applied Mathematics

3.1 "Delayed Employment" Mentality and Insufficient Employment Willingness

3.1.1 The Widespread Phenomenon of "Delayed Employment"

In recent years, a certain degree of "delayed employment" and "deferred employment" phenomenon has appeared among mathematics graduates. Some students are not eager to seek employment after graduation but choose to "retake the postgraduate entrance exam" for a second time, take civil service exams, or take a "gap year." This mentality stems partly from high expectations for an "ideal job" and is also closely related to the craze for postgraduate entrance exams and civil service exams. Some studies point out that some students miss employment opportunities due to information asymmetry or insufficient job-seeking skills.

3.1.2 Employment Difficulties of the "Second Attempt" Postgraduate Exam Group

Taking the postgraduate entrance exam twice is a relatively common phenomenon among mathematics graduates. The cut-off scores for mathematics postgraduate exams are relatively high, and competition is fierce, leading some students who fail the first attempt to choose to try again for a year. However, during the "second attempt" period, students lose their status as fresh graduates and lack practical work experience; if they fail again, they will face even greater employment pressure.

3.1.3 Deep-seated Reasons for the Decline in Employment Willingness

There are multiple reasons behind the "delayed employment" mentality: first, the improvement of family economic conditions, with some families not eager for their children to start working; second, higher expectations for career development, preferring to wait rather than "settle"; third, some students lack confidence in their own abilities and postpone employment pressure through continued learning. These factors together lead to graduates' insufficient job-seeking initiative.

3.2 Vague Career Cognition and Unclear Positioning

3.2.1 Limited Understanding of Industries

Some mathematics majors have limited understanding of the job market and do not know which positions their major qualifies them for. Some students restrict their employment horizons to the two options of "mathematics teacher" or "postgraduate studies," lacking understanding of positions in finance, IT, data analysis, and other fields. A survey targeting lower-year mathematics majors showed that many students have the misconception of "only learning knowledge without planning for the future."

3.2.2 Weak Career Planning Awareness

A considerable number of mathematics majors lack systematic career planning. They focus on coursework in the first and second years, only start considering employment directions in the third year, and find a gap between their abilities and job requirements when job hunting in the fourth year. Some

research emphasizes that college students should establish career planning awareness from the early years and clarify their development paths.

3.2.3 Confusion in Matching Abilities with Positions

A prominent problem faced by mathematics graduates is that they are unclear about their core competitiveness and suitable job directions. Compared to applied majors such as accounting and computer science, the "interface" of the mathematics major is not sufficiently clear, which is both an advantage (broad employment scope) and a disadvantage (vague positioning).

3.3 Disconnect Between Practical Abilities and Market Demand

3.3.1 Curriculum Emphasizes Theory over Application

The curriculum of traditional mathematics majors is primarily theoretical, with relatively weak applied courses and practical components. Students master a large number of theorem proofs and formula derivations but lack training in applying mathematical methods to practical problems. Taking the normal direction as an example, some research points out that strengthening the professional skills training of normal students and enhancing their professional quality and employment competitiveness is extremely urgent.

In actual teaching, there is a problem of "disconnect between professional quality and job requirements." Employers generally hope to hire graduates who can quickly get up to speed at work and possess strong learning ability; but some mathematics graduates have shortcomings in programming ability, use of data analysis tools, project management, and other areas.

3.3.2 Weak Internship and Practice Links

Internships are an important bridge connecting campus and the workplace. However, due to curriculum arrangements, limited internship base resources, and other reasons, some mathematics students have insufficient internship experience. The short internship duration (mostly 4-8 weeks) and shallow content (mostly classroom observation rather than actual teaching or project participation) make it difficult to achieve the goal of exercising practical abilities.

Some universities explicitly state that "integration of internship and employment" should be made a top priority, using "real practice" at the frontline of education to solve problems such as "vague career cognition, disconnect between professional quality and job requirements, and insufficient job-seeking ability."

3.3.3 Insufficient Cultivation of Interdisciplinary Abilities

With the growing demand for "Mathematics +" composite talents, single knowledge of mathematics is no longer sufficient to meet market needs. However, in the curriculum of mathematics majors at some universities, courses in interdisciplinary fields such as finance, computer science, and data analysis account for a relatively low proportion, and students lack systematic learning opportunities. This directly leads to graduates' insufficient competitiveness when job hunting.

3.4 Insufficient Job-Seeking Skills and Preparation

3.4.1 Lack of Resume and Interview Skills

Some mathematics majors have inadequate preparation in job-seeking skills. Their resume preparation is not standardized, and the focus is not prominent – failing to effectively "quantify results" or "highlight the application of mathematical skills"; their logical expression during interviews is not clear enough, lacking case support; their research on industries and positions is not deep enough, making it difficult to demonstrate understanding of the company and enthusiasm for the position during interviews.

3.4.2 Limited Information Acquisition Channels

Graduates have relatively single channels for obtaining employment information. Some students rely only on the school's employment website and counselor notifications, making insufficient use of industry recruitment platforms, corporate campus recruitment websites, and alumni internal referrals. Information asymmetry leads to missing the timing for application and registration for high-quality positions.

3.4.3 Lack of Professional Qualification Certifications

In fields such as finance and IT, having relevant professional qualification certifications is an important plus for job seeking. However, some mathematics majors do not systematically prepare for certifications such as CPA, CFA, FRM, or computer grade examinations during their university years, putting them at a disadvantage under equal conditions. Some universities recommend that students plan for qualifications early to enhance competitiveness.

3.5 Insufficient Ability for Interdisciplinary Integration

3.5.1 Lack of "Mathematics +" Awareness

Despite strong market demand for "Mathematics +" composite talents, some students remain confined to "pure mathematics" thinking, lacking the awareness to actively extend into fields such as finance, data, and artificial intelligence. Some experts point out that mathematics students should make good use of "Mathematics +" thinking and actively extend into fields such as artificial intelligence, big data, and finance.

The reasons for this are, on the one hand, insufficient understanding of market demand and, on the other hand, a lack of motivation and guidance for interdisciplinary learning.

3.5.2 Low Participation in Minors and Double Degrees

Most universities offer opportunities for minors or double degrees, but the participation rate among mathematics students is not high. Some students worry that a minor will affect their major grades, while some think "learning mathematics well is enough." This cognitive bias restricts the expansion of students' knowledge structure and their space for employment choices.

4. Countermeasures to Promote the Employment of Graduates Majoring in Mathematics and Applied Mathematics

4.1 Strengthening Career Planning Education

4.1.1 Establishing a Grade-Level Career Planning System

Universities should establish a grade-level career planning education system from the first to the fourth year. For the lower grades (first and second years), focus on "industry awareness" and "academic

planning," helping students understand the employment directions and development paths of the mathematics major, breaking the misconception of "only learning knowledge without planning for the future." For the middle grades (second and third years), focus on "ability cultivation" and "internship practice," guiding students to participate in subject competitions, research projects, and internship activities to accumulate practical experience. For the upper grades (third and fourth years), focus on "job preparation" and "precise matching," providing services such as resume guidance, mock interviews, and job recommendations.

Some research points out that university counselors should systematically carry out employment guidance for normal students, starting from three aspects: analysis of employment status, career planning, and improvement of employment guidance ability.

4.1.2 Strengthening Industry Awareness Education

Invite experts and alumni from industries such as finance, IT, and education to give lectures on campus, introducing students to industry development trends, job competency requirements, and career development paths. Organize company visits to give students a close-up understanding of the workplace environment. Broaden students' employment horizons through activities such as "Industry Awareness Week" and "Open Day at Enterprises."

Some universities explicitly recommend that students "broaden their employment horizons and tap into development potential," finding suitable development directions by understanding the talent needs of different industries.

4.1.3 Leveraging the Exemplary Role of Alumni Resources

Alumni are important resources for career planning education. Invite alumni who have achieved success in different industries to return to campus to share their experiences, using real-life cases to motivate students' employment drive. Establish an alumni mentor database to provide one-on-one career consultations for current students. Use alumni networks to expand internship and employment opportunities.

4.2 Constructing a "Mathematics +" Composite Talent Cultivation System

4.2.1 Optimizing Curriculum Structure

The mathematics major's curriculum should shift from "pure mathematics" to "Mathematics +," systematically introducing interdisciplinary courses. Specific suggestions: For the finance direction, offer courses such as Financial Mathematics, Financial Engineering, and Econometrics; for the IT direction, offer courses such as Data Structures, Machine Learning, and Data Analysis; for the statistics direction, offer courses such as Applied Statistics, Time Series Analysis, and Data Visualization.

Curriculum adjustment should follow the principle of "mathematics core courses guaranteeing a foundation, directional module courses emphasizing application," ensuring that students possess interdisciplinary application abilities while mastering solid mathematical skills. As experts say, mathematics students should "break down disciplinary barriers to become composite talents."

4.2.2 Encouraging Minors and Cross-disciplinary Learning

Universities should actively encourage mathematics students to minor in second degrees such as finance, statistics, or computer science, or to take related electives. Establish a credit transfer mechanism, incorporating minor courses into the elective module of the training program. A minor or double degree not only expands knowledge structure, but graduates with a "dual-discipline" background have a clear advantage in job hunting.

4.2.3 Strengthening Mathematical Modeling and Computing Ability

Mathematical modeling is the bridge connecting mathematical theory with practical problems. Universities should strengthen the construction of mathematical modeling courses and the organization of mathematical modeling competitions, cultivating students' ability to abstract practical problems and solve models. At the same time, strengthen training in programming ability and data processing ability, integrating the teaching of tools such as Python, R, and MATLAB into the curriculum system.

4.3 Deepening Industry-Education Integration and School-Enterprise Cooperation

4.3.1 Establishing Internship Bases and Order-Based Training

Universities should establish long-term cooperative relationships with financial institutions, technology companies, primary and secondary schools, and educational institutions to establish stable internship bases. Explore "order-based" talent training models, customizing training programs according to enterprise needs to achieve precise alignment between talent cultivation and talent use.

In internship arrangements, the concept of "integration of internship and employment" should be implemented. Students who perform excellently during internships can directly receive job offers, solving the problem of "disconnect between professional quality and job requirements."

4.3.2 Carrying out Project-Based Learning and Joint Enterprise-University Course Development

Introduce real enterprise projects and carry out project-based learning. Students complete projects under the joint guidance of teachers and enterprise mentors, accumulating practical experience and enriching their job-seeking portfolios. Invite enterprise technical experts to participate in course teaching, bringing industry frontier technologies and practical experience into the classroom.

4.3.3 Organizing Specialized Job Fairs and Position Matching

Targeting the characteristics of the mathematics major, organize industry-specific job fairs, inviting employers from educational institutions, financial institutions, technology companies, etc., to participate. Establish an internship and employment information release platform to accurately push position information. Establish a dynamic tracking ledger for unemployed students, summarizing job-seeking progress weekly to ensure that assistance measures are effectively implemented.

4.4 Improving the Employment Guidance Service System

4.4.1 Enhancing the Professional Level of Employment Guidance

Strengthen the construction of the employment guidance team, improving counselors' professional knowledge in employment policies, industry awareness, job-seeking skills, etc. Establish an employment guidance studio to provide one-on-one career consultations and job-seeking guidance for students.

Organize a series of employment guidance activities, including resume workshops, mock interviews, industry salons, written test preparation, etc.

Some research emphasizes that university counselors' employment guidance ability directly affects students' employment quality, and efforts should be made to improve counselors' levels from both theoretical learning and practical training.

4.4.2 Implementing "One Student, One Strategy" Precise Assistance

Establish ledgers for students with employment difficulties and implement "one student, one strategy" precise assistance. Dynamically track students' employment progress and job-seeking intentions, matching suitable position resources. For students who fail the postgraduate entrance exam, provide psychological counseling and push spring recruitment additional information; for students with insufficient employment willingness, conduct motivational talks to help them change their mindset.

4.4.3 Strengthening Job-Seeking Skills Training

Carry out systematic job-seeking skills training, including: resume writing and optimization (quantifying results, highlighting mathematical skills), interview techniques and simulation (structured interviews, leaderless group discussions), industry research and position analysis, salary negotiation, and job offer selection. Through the combination of theoretical explanation and practical drills, effectively improve students' job-seeking abilities.

4.5 Guiding Students to Change Their Employment Concepts

4.5.1 Establishing the Concept of "Get a Job First, Then Choose a Career"

Targeting the mentality of some students who "refuse to work unless it's an ideal position," guide them to establish the concept of "get a job first, then choose a career." First, accumulate work experience, understand the industry, and clarify direction through employment; then, adjust positions or industries according to development needs later on. Being too obsessed with taking the "perfect first step" may lead to missing development opportunities.

4.5.2 Broadening Employment Horizons and Paths

Help students broaden their employment horizons, recognizing that the advantages of the mathematics major of "broad employment, strong adaptability" are not limited to teaching positions but also cover multiple fields such as financial risk control, AI algorithms, and data analysis. Encourage students to actively try different industries and positions to discover their interests and areas of strength. At the same time, guide graduates to pay attention to grassroots employment projects such as the "Special Post Plan," "Three Supports and One Assistance," and "West Plan," serving national strategies.

4.5.3 Enhancing Professional Confidence and Confidence in Development

Mathematics, as the "underlying language of technological innovation," holds an irreplaceable position in the national innovation-driven development strategy. In employment guidance, students' professional confidence should be enhanced, helping them realize that solid mathematical skills are the core manifestation of quantitative analysis ability and logical thinking ability, serving as the "pass" to enter high-value industries. As long as one is good at transforming mathematical abilities into workplace

competitiveness, one can find a suitable development path.

5. Conclusion

The employment problem of undergraduate graduates majoring in Mathematics and Applied Mathematics is both an important issue facing the development of this major and a key factor in whether the mathematics discipline can continue to attract excellent students. This research shows that graduates of this major have the advantages of broad employment prospects and strong adaptability, mainly targeting industries such as education, finance, and IT. However, they also face multiple challenges, including the continuously rising number of graduates, structural contradictions between supply and demand, and the impact of artificial intelligence.

From the perspective of problem diagnosis, the "delayed employment" mentality, vague career cognition, disconnect in practical abilities, insufficient job-seeking skills, and lack of interdisciplinary ability are the main bottlenecks restricting the employment quality of graduates of this major. These problems stem partly from factors at the individual student level and also reflect the misalignment between university talent cultivation and market demand.

In response to the above problems, this paper proposes systematic countermeasures and suggestions: strengthen career planning education to help students clarify their development direction early; construct a "Mathematics +" composite talent cultivation system to enhance interdisciplinary competitiveness; deepen industry-education integration and school-enterprise cooperation to strengthen practical ability cultivation; improve the employment guidance service system to implement precise assistance; guide students to change their employment concepts and broaden their employment horizons.

The employment work for the Mathematics and Applied Mathematics major is a systematic project requiring the collaborative efforts of universities, students, employers, and government departments. Universities should actively adapt to market changes and promote the reform of talent cultivation models; students should enhance their proactive awareness, plan early, and prepare actively; employers should view the value of talents with mathematical backgrounds more openly. Only through multi-party collaboration and sustained effort can the goal of high-quality and full employment for mathematics graduates be achieved.

References

Analysis of Employment Quality and Countermeasures for Graduates of Mathematics Majors – Taking the 2022 Graduates of Mathematics Majors at Yili Normal University as an Example. *Science and Technology Wind*, *2023*(36).

Assistant to the President Wang Xiaomei Entered the Science College Classroom to Teach College Students Ideological and Political Course. China University of Petroleum (East China), 2025-12-12.

College of Science Organizes University Student Career Planning Lecture. Xi'an University of Science and Technology, 2025-10-23.

Liang, J. (2023). Research on University Counselors' Employment Guidance Work – Taking the Mathematics and Applied Mathematics (Normal) Major as an Example. *Science and Education Guide*, *2023*(2), 136-138.

School of Mathematics and Information Engineering Holds 2027 Graduate Education Internship Mobilization and Employment Work Launch Meeting. Longdong University, 2026-03-08.

School of Mathematics and Statistics, Minnan Normal University. Analysis Report on Employment Quality of 2024 Graduates. Minnan Normal University, 2025.

School of Mathematics Holds Exchange Meeting for 2021 Grade Unemployed Students – Precise Measures to Assist High-Quality Employment of Graduates. Chengdu Normal University, 2025-05-08.

School of Statistics Holds Professional Cognition Session for 2023 Undergraduates. Capital University of Economics and Business, 2025-03-30.

Zhao, J. H., Shen, P., Fu, L. Y., et al. (2024). Analysis of Transformation Employment Tendencies of Mathematics Normal Students in Local Institutions. *Journal of Hubei Normal University*, *2024*(14).