Analysis and Research on Undergraduate Data Science Major Training Based on Online Market Demand

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Abstract: This article aims to explore optimization strategies for undergraduate data science training under the demand of the online market. By analyzing the current problems in training, such as the disconnect between theory and practice, and vague career planning, methods are proposed to strengthen the practical teaching system, enhance the construction of the teaching staff, improve career planning guidance, and deepen school enterprise cooperation models. The research results show that these measures can effectively enhance students' practical abilities and employment competitiveness. Deepening school enterprise cooperation, strengthening practical teaching and other strategies are crucial for cultivating high-quality data science talents that meet the needs of the online market, and help promote the sustainable and healthy development of the data science field.

Keywords: Online market demand; Undergraduate Data Science; Cultivation characteristics; There are problems

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Introduction

With the rapid development of information technology and the popularity of the Internet, data science has become an important force to promote social progress and economic development. As an important position to train data science talents, the quality of undergraduate data science training is directly related to the development level of data science and national competitiveness. In the context of the demand in the online market, undergraduate data science majors face many challenges and problems in their training. This article aims to provide useful references and guidance for improving the quality of undergraduate data science training by analyzing the characteristics, existing problems, and corresponding optimization strategies of undergraduate data science training.

1.Characteristics of Undergraduate Mathematics Training under the Demand of Online Market

1.1The forefront of curriculum design

Driven by the demand of the online market, the training of undergraduate data science majors exhibits distinct cutting-edge course offerings. This major closely tracks the latest trends in technological development and is committed to building a core curriculum system that covers cutting-edge fields such as big data analysis, machine learning, and artificial intelligence. As the foundation of data science, big data analysis emphasizes the ability to collect, process, analyze, and interpret data. Machine learning focuses on algorithm design and model training, enabling students to master key skills such as prediction, classification, and clustering. Artificial intelligence courses further broaden students' knowledge horizons, covering advanced applications such as natural language processing and computer vision. These courses not only focus on imparting theoretical knowledge, but also emphasize the cultivation of practical abilities. Through practical analysis, project practice, and other methods, students are constantly exposed to and solve practical problems in the learning process, effectively enhancing their professional competence and competitiveness.

1.2Cultivation of practical ability

Guided by the demand of the online market, undergraduate data science majors place particular emphasis on cultivating practical abilities. Through various methods such as internships and project driven training, students' hands-on

and problem-solving skills are effectively enhanced. On the one hand, this major actively collaborates with enterprises to establish internship bases, allowing students to encounter and handle practical problems related to data science in real work environments, deepening their understanding and application of professional knowledge. On the other hand, project driven teaching methods have become an important way to strengthen practical abilities. Students are encouraged to participate in various data science projects, from project planning, data collection, model construction to result analysis, and fully participate and lead the implementation of the projects. This process not only exercises students' teamwork ability, but also enables them to continuously try and make mistakes, reflect and improve in the process of solving practical problems, cultivating solid data science practical skills.

1.3Interdisciplinary integration

Driven by the demand of the online market, undergraduate data science majors have shown significant interdisciplinary integration characteristics, committed to cultivating compound talents with multidisciplinary backgrounds. This major not only delves into the theory and practice of data science itself, but also actively integrates with disciplines such as computer science, statistics, and economics. Computer science provides strong technical support for data science, including algorithm design, data processing platform construction, etc. Statistics provides a solid theoretical foundation for data analysis, including probability theory, mathematical statistics and other methodologies, while economics endows data science with practical value orientation, such as market analysis, predictive model construction, etc. Through interdisciplinary learning and research, students can not only master the core skills of data science, but also broaden their knowledge horizons, enhance their comprehensive qualities, and better adapt to the complex and ever-changing data science work environment under the demands of the online market.

1.4The Utilization of Online Learning Resources

In the context of the demand in the online market, undergraduate data science majors make full use of rich online learning resources such as large-scale open online courses and online programming platforms to enrich students' learning paths and meet their personalized learning needs. The large-scale open online courses provide high-quality courses taught by top universities and experts at home and abroad, covering various fields of data science, enabling students to independently choose their learning content and flexibly arrange their study time. At the same time, online programming platforms such as Coursera and edX effectively enhance students' programming abilities and practical skills in data science through interactive programming exercises and project practices. The utilization of these resources not only broadens students' learning channels, but also promotes the cultivation of self-learning and lifelong learning abilities, enabling students to keep up with the forefront of technology, continuously improve their competitiveness, and better adapt to the changing needs of the online market.

2.Problems in undergraduate mathematics education under the demand of the online market

2.1The disconnect between theory and practice

Driven by the strong demand in the online market, a core issue has gradually emerged in the training process of undergraduate data science majors, which is the disconnect between theory and practice. Specifically, some course offerings focus too much on imparting theoretical knowledge, while neglecting the deep integration and close integration with practical application scenarios. Although students can systematically learn the basic principles, algorithm models, and theoretical frameworks of data science in the classroom, this highly theoretical teaching model fails to provide sufficient practical opportunities to apply knowledge to solve practical problems. The separation of theory and practice not only limits students' ability to translate learned theories into practical skills, but also affects their adaptability and innovation ability when facing complex and ever-changing data science challenges.

2.2Insufficient teaching staff

Under the rapid changes in demand in the online market, undergraduate data science majors are facing the problem

of insufficient teaching staff, especially the mismatch between the number and quality of teachers, which has become a key factor restricting the development of the profession. On the one hand, with the rapid expansion of the data science field, the demand for teachers has increased sharply, and the existing number of teachers is unable to meet the growing teaching needs. On the other hand, the quality of the teaching staff also faces challenges, especially the lack of teachers with rich industry experience. Data science is a highly practical discipline that requires teachers not only to have a profound theoretical foundation, but also to have the ability to apply theory to practical problems. Currently, many teachers majoring in data science mainly come from academic backgrounds and lack practical experience in the field of data science, which to some extent limits the cultivation of students' practical abilities.

2.3Fuzzy career planning for students

In the context of diversified demand in the online market, undergraduate data science majors face an important issue of ambiguity in their career planning. Many students lack a clear understanding and clear plan for their future career direction when entering the data science major. On the one hand, the field of data science covers a wide range of areas, from big data analysis, machine learning to artificial intelligence, and students often find it difficult to determine their interests and expertise. On the other hand, due to a lack of in-depth understanding of online market demand, students find it difficult to effectively combine their personal interests with market demand and develop practical and feasible career plans. The shortcomings of universities in career planning education, such as the lack of systematic career guidance courses, industry expert lectures, and internship and training opportunities, have also exacerbated the ambiguity of students' career planning.

2.4Insufficient depth of enterprise cooperation

In the dynamic changes of demand in the online market, a key issue faced by undergraduate data science majors is the insufficient depth of cooperation between enterprises. Currently, although universities and enterprises have established certain cooperative relationships, the forms of cooperation are often relatively single and lack deep cooperation projects. This superficial cooperation mainly manifests in the construction of internship bases, employment recruitment, and other aspects, but fails to delve into more critical areas such as curriculum development, scientific research cooperation, and joint training. Due to the lack of in-depth collaborative projects, students find it difficult to gain true experience in data science projects during internships, which affects their practical and innovative abilities. At the same time, the limitations of this collaborative model also limit the expansion of students' employment channels and the improvement of employment quality.

3.Optimization Strategies for Undergraduate Mathematics Training under the Demand of Online Market

3.1Strengthening the practical teaching system

In response to the problem of the disconnect between theory and practice in undergraduate data science training under the demand of the online market, the primary task of optimizing countermeasures is to strengthen the practical teaching system. Specifically, universities should actively establish deep cooperative relationships with enterprises and jointly build a school enterprise cooperation platform as a bridge connecting theory and practice. Through this platform, enterprises can transform complex data science problems encountered in their actual operations into teaching cases and introduce them into undergraduate course learning and practical training. At the same time, increase students' internship and training opportunities in enterprises, enabling them to apply their learned knowledge in real work environments and solve practical problems. This teaching mode that closely combines theoretical knowledge with practical operation can not only help students deeply understand the principles and methods of data science, but also effectively enhance their ability to solve practical problems and narrow the gap between theory and practice. The construction of school enterprise cooperation platforms also helps enterprises to intervene in the talent cultivation process in advance, select and reserve excellent data science talents, and achieve a win-win situation.

3.2Strengthen the construction of the teaching staff

The key to optimizing the training of undergraduate data science majors under the demand of the online market lies in strengthening the construction of the teaching staff. Universities should actively introduce teachers with rich industry backgrounds, which can not only bring the latest industry trends and technological developments into the classroom, but also provide students with more practical and forward-looking teaching content. The addition of these teachers will effectively enhance the overall quality and practical ability of the teaching team. Universities should regularly carry out teacher training programs, including attending industry seminars, corporate visits, professional training, etc., with the aim of enhancing teachers' professional competence, industry insight, and teaching ability. Through systematic training, teachers can better understand industry demands and development trends, adjust and optimize teaching content, and make it more in line with market demand. Encouraging teachers and enterprises to carry out joint scientific research activities is also an important way to enhance teachers' industry insights and practical abilities. Through these measures, the problem of insufficient teaching staff can be effectively alleviated, providing a solid guarantee for the cultivation of high-quality talents in undergraduate data science majors.

3.3Improve career planning guidance

One of the optimization measures to address the problem of vague career planning for undergraduate students majoring in data science under the demand of the online market is to improve the career planning guidance system. Universities should attach great importance to students' career planning education, and provide comprehensive theoretical knowledge and practical guidance for students through the establishment of systematic career planning courses. These courses should cover career paths, industry trends, essential skills and qualities in the field of data science, helping students establish a clear understanding of career development. Universities should regularly invite experts in the industry to give lectures, share their career experiences, industry insights, and career development suggestions, in order to enhance students' industry awareness and grasp of future career directions. At the same time, personalized career planning consulting services are provided, tailored to students' personal interests, strengths, and market needs, to help students clarify their career goals and develop practical and feasible career development plans. Through these measures, the problem of vague career planning for students can be effectively solved, and their employment competitiveness and career development ability can be enhanced.

3.4Deepen the model of school enterprise cooperation

In response to the insufficient depth of enterprise cooperation in undergraduate data science training under the demand of the online market, the fourth optimization strategy is to deepen the school enterprise cooperation mode and explore diversified cooperation paths. Specifically, universities and enterprises can jointly explore joint training mechanisms, allowing students to participate in practical project research and development under the guidance of enterprise mentors, deepen theoretical knowledge, and enhance professional skills in practice. At the same time, both parties can jointly build laboratories, introduce advanced data science equipment and tools, and provide students with good experimental conditions and practical environments. Encourage and support cooperation between universities and enterprises in research and development projects, transform the actual needs of enterprises into scientific research projects, and promote technological innovation and application development in the field of data science through deep integration of industry, academia, and research. The deepening of these cooperation models can not only enhance the practicality and pertinence of education, but also promote the transformation and application of scientific research results, injecting new vitality into the development of the field of data science. Through these measures, the practical and innovative abilities of undergraduate students majoring in data science can be effectively enhanced, better meeting the needs of the online market.

Conclusions

This article studies the characteristics, existing problems, and optimization strategies of undergraduate data science training under the demand of the online market. The following conclusions are drawn: undergraduate data science training

should focus on the cultivation of practical abilities, interdisciplinary integration, and the utilization of online learning resources. At the same time, it also faces problems such as the disconnect between theory and practice, insufficient teaching staff, vague career planning for students, and insufficient depth of enterprise cooperation. To address these issues, optimization measures such as strengthening the practical teaching system, enhancing the construction of the teaching staff, improving career planning guidance, and deepening school enterprise cooperation models are proposed. The implementation of these measures will help improve the quality of undergraduate data science education and provide strong talent support for the development of the data science field and the enhancement of national competitiveness.

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