Analysis of the Reform of Navigation System Internship Course for Industry Needs

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Abstract: With the rapid development of science and technology and changes in industry requirements, the use of satellite positioning technology has become increasingly widespread, involving various fields such as transportation, logistics, urban planning, etc. However, the current navigation system internship courses are difficult to adapt to the development of the industry, resulting in insufficient technical and knowledge reserves for students in practice. Therefore, based on reality, in-depth research and analysis will be conducted on the navigation system internship course to adapt to the development needs of the industry and market. And conduct specific analysis on the problems existing in the navigation system internship course, in order to establish a solid comprehensive quality talent in the navigation system profession for universities and industries, and to have a more positive role in educating people. This article analyzes and discusses the reform of navigation system internship courses based on industry needs, hoping to provide suggestions or inspiration for relevant workers.

***Keywords*:** industry demand, navigation system internship course, reform, innovation driven talent cultivation, mechanism research

1. Introduction

The continuous improvement of economic integration and intelligence worldwide has made satellite positioning systems increasingly prominent in various industries. The positioning accuracy and reliability of the fields in which this type of technology is applied have become important factors that constrain human production and work efficiency. However, currently in the teaching of navigation system internship courses in universities, the navigation system technology involved is highly theoretical and lacks practical training for enterprise production and practice, resulting in the phenomenon of "blind obedience" among graduates after entering the workforce. At the same time, the development of industries and markets has put forward higher demands for the quality of such vocational and technical personnel. Therefore, in such a large environment, it is particularly important to innovate the navigation system internship courses to adapt to the needs of the industry, improve students' practical operation and professional quality, and promote the normalized development of China's navigation system field.

2. The practical application of navigation systems in various fields of construction in China in the new era

With the continuous development of science and technology, navigation systems (positioning technology) have been widely used in the construction of all walks of life, especially in urban traffic management, logistics distribution, driverless vehicles and mobile Internet construction. In urban road construction, navigation system technology can improve the efficiency of road traffic and alleviate road congestion by analyzing and monitoring real-time information of roads. For example, by integrating GPS technology with GIS technology, traffic managers can adjust the use of traffic lights in a timely manner, thereby achieving the goal of minimizing traffic congestion to the greatest extent possible. At the same time, by integrating with big data, real-time monitoring and early warning of road environment can be achieved, enhancing the normalization of urban management.

In addition, applications based on vehicle positioning systems can achieve optimal selection of vehicle paths, reduce vehicle speed and costs, and improve customer satisfaction. Especially with the rapid development of China's e-commerce industry at present, accurate network positioning is crucial for ensuring fast logistics transportation and safety management. In addition, drones are a popular technology in current global positioning research, and their key lies in high-precision electronic maps and advanced sensing technology. They can not only meet the needs of real-time positioning, but also have the ability to deal with various emergencies. At the same time, the rapid development of navigation systems based on

artificial intelligence, machine learning, and other technologies, as well as the autonomous navigation technology of drones, real-time positioning in mobile applications, shared directions, and path planning, not only improves the convenience of individual travel, application, and planning, but also drives the demand for navigation system technology in various fields.

3. Market oriented navigation system talent needs

In order to meet the requirements for navigation system personnel in the above urban traffic management, logistics distribution, driverless vehicles and mobile Internet construction fields, navigation system talents need to take hands-on operation as the prerequisite, and be familiar with the whole process of navigation system design, development and implementation during practice and work, and such talents need to have the ability to independently solve various problems existing in the project, such as the repair, maintenance and redesign of the navigation system. Not only that, navigation system talents need to have creative thinking ability. In today's rapidly developing technology, they need to have an open mind and be able to come up with some novel methods to promote the continuous development of technology. This plays a particularly important role in promoting innovation driven development in China's navigation system field. Moreover, in the teaching of navigation system courses in universities, it is not difficult to find that the demand for interdisciplinary studies is constantly increasing. Navigation systems involve multiple disciplines such as computer science, geographic information science, and automation engineering, and require effective internalization of basic knowledge and professional skills in this field in order to ensure that navigation system talents can communicate and cooperate efficiently in complex technological environments. Such comprehensive qualities can lay a solid foundation for future work in navigation systems, and also provide talent needs for the sustainable development of the navigation system industry.

4. Common teaching bottlenecks in current navigation system internship courses

At present, the teaching mode of navigation system internship courses in China is single, and on the one hand, there is an imbalance between theoretical and practical teaching content. Although the current teaching content of navigation system internship courses mostly involves basic theories such as satellite positioning principles, map data processing, and path planning, the lack of a large number of internship opportunities makes it difficult for students to apply the theoretical knowledge they have learned to their daily lives. For example, in the teaching of GPS systems, many students only listen to the teacher's explanation during class and do not personally experience the real-time acquisition technology and information processing application of GPS, resulting in various problems encountered by students in real work internships that cannot be solved in a timely manner.

On the other hand, the neglect of industry development in the navigation system internship course is also the biggest loophole of this course at present. With the rapid development of navigation technology, many new technological applications have emerged in the industrial field, such as intelligent navigation, connected vehicles, etc. However, many disciplines have not yet been explored, applied, and updated theoretically. In practical navigation system internship courses, it is difficult for students to keep up with the development trend of the industry, and it is also not conducive to students effectively planning their future career development direction. Therefore, based on the development market background of navigation systems in the new era, universities should continuously adjust their teaching content, encourage students to actively participate in relevant scientific research plans and innovative activities, enhance their sensitivity and adaptability to the development of the navigation system industry, and thus improve the practicality of navigation system internship courses.

5. Suggestions for the Reform of Navigation System Internship Course Targeting Industry Needs

5.1 Based on the market demand for navigation systems, add internship subject courses

In order to better meet the development needs of the navigation system field, it is of great significance to make necessary changes to the professional content of navigation system internship courses, strengthen practical teaching, and improve the overall ability and professional competitiveness of college students. Through long-term collaboration with leading companies in the industry, targeted training programs can be carried out to enable students to better enter the production site and personally experience the development, testing, and application of navigation systems. The teaching method of "combining engineering with practice" can also be adopted, which not only enables students to apply the theories they have learned to engineering practice, but also exercises their practical skills and collective cooperation awareness. At the same time as meeting the needs of the industry, corresponding thematic research should be carried out. Students can personally experience the process of independent research and optimization of navigation systems during the learning process, and

improve their technological level and creative thinking.

Moreover, in the optimization and innovation of navigation system internship courses, case studies and practical analysis are the main goals. Through typical cases and the latest technology in navigation system internship courses, students are guided to conduct in-depth analysis, thereby improving their sensitivity to industrial development and technological adaptability. On this basis, the navigation system internship course can conduct empirical research on specific cases based on the cutting-edge research progress of navigation systems at home and abroad, as well as market trends, so that students can truly apply the knowledge they have learned to practice, thereby achieving seamless integration between navigation system internship education and industry needs, and promoting the normalized development of the navigation system field.

5.2 Enhance industrial collaboration and develop systematic school-based curriculum design

With the rapid development of technology, based on industry needs, the reform of navigation system internship course teaching should not rely on a single subject, but should increase cooperation with enterprises. Two methods can be adopted: one is to hire enterprise professionals to participate in the navigation system internship course teaching plan, and the other is to create enterprise practice bases to ensure that the teaching content meets the needs of industry development. These two forms not only have rich practical work experience, but also have a deep understanding of industrial development. They can timely revise the content of navigation system internship courses, and combine advanced methods such as high-precision positioning artificial intelligence to adjust the effectiveness of navigation system internship school-based curriculum design and development based on feedback from navigation system internship courses, in order to improve students' professional quality. The implementation of such projects can not only create practical opportunities for students, but also achieve sharing between schools and enterprises in equipment, technology, projects, and other aspects. However, in the process of collaboration, it is also necessary to pay attention to the feedback from interns, identify problems in teaching, and continuously improve the curriculum to accelerate the connection between teaching and industry needs. Through such two-way interaction, students can gain experience and knowledge from practice, which helps them better enter the workplace. At the same time, enterprises can also provide high-quality professional and technical personnel according to their own needs, thus achieving a good development of "production learning research teaching".

5.3 Introducing new technologies and trends to achieve interdisciplinary integration of navigation system internship courses

In the new round of navigation system internship courses, advanced technology must be introduced. Examples such as GPS and GIS provide practical application platforms for navigation system internship courses, enabling students to better understand high-precision positioning and navigation technologies. Not only that, the navigation system internship course can cross integrate disciplines such as sensor fusion, machine learning, and big data analysis, making the navigation system internship course have independent intellectual property rights, improving the depth of navigation system internship content, and enabling students to solve real-world problems and enhance their overall quality through a "project driven" approach. On this basis, the navigation system internship course also needs to introduce industry experts and enterprises to participate in the design and teaching of the course, ensuring that the courses offered are closely integrated with industry needs, and using internships, research projects, and other methods to improve the work ability and comprehensive quality of navigation system graduates. Based on the practical experience of the navigation system internship course and emphasizing the penetration of interdisciplinary knowledge, a comprehensive, practical, and forward-looking teaching model for navigation system internship courses has been formed to meet the development needs of the current market, all of which are feasible.

6. Conclusion

To sum up, with the research achievements in the field of navigation system technology and unmanned aerial vehicles at the forefront at home and abroad, the navigation system practice courses are closely combined with the needs of industrial development. Therefore, in order to meet the needs of navigation system talents in the above urban traffic management, logistics distribution, driverless vehicles and mobile Internet construction fields, the interdisciplinary needs of the navigation system practice courses are emphasized on the premise of hands-on operation to promote the continuous development of science and technology. Therefore, in view of the common teaching bottlenecks existing in the navigation system practice courses at this stage, in combination with the market needs of the navigation system, practice courses are added, industry cooperation is strengthened, the school-based curriculum design of systematic operation is developed, new technologies and trends are introduced, and the interdisciplinary integration of the navigation system practice courses is realized, thus promoting the normal development of the navigation system field.

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