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Design of simulation experiment platform based on GPS teaching for navigation students

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Abstract

In order to solve the problems that navigation students are limited in time and space and the students' capacity at the same time during the course of GPS learning and practice, the GPS teaching simulation experiment platform is planned to be applied to navigation students' class to solve the related problems. Using this simulation experiment platform can allow students to simulate the GPS device anytime and anywhere, and the capacity of students in the teaching process will be greatly improved, so that students can better integrate into the classroom. The GPS simulation experiment platform is presented in the form of a website. The teacher can issue commands during teaching, break the limit of the number of real machines, and can operate together, which has stronger interaction and integration. Based on the above points, GPS teaching simulation experiment platform will make navigation students' learning more convenient and efficient.

Keywords

GPS; Simulation experiment platform design; Convenient teaching and learning.

1. Introduction

When a ship is sailing at sea, GPS, as the backbone equipment of the ship, provides the ship with position information[1]. At the same time, other instruments on the ship's steering platform, such as AIS, radar, electronic chart and other equipment as the "eyes" of the ship, must be connected with GPS to obtain information, which further reflects the importance of GPS to the ship. And GPS operation learning is also an indispensable part in the professional training programs of major maritime colleges and universities. However, through the actual visit and real class experience, it is known that most of the navigation colleges and universities use real machines to operate and practice when teaching, and the number of real machines is rarely stored in the laboratory, which brings inconvenience to students in time and space during the learning and practice process. In addition, due to the limited number of real machines, teachers have low tolerance in the teaching process, which leads to low participation of students in the class, which will affect the learning efficiency of students. In view of the above problems, we designed and researched the "GPS teaching simulation experiment platform", which is to keep up with the development trend of ship automation in The Times[4]to train high-quality nautical talents, solve the problem of inconvenient time and space in learning, and solve the problem of student capacity in teaching. So that students can learn better, more practice, so as to improve students' learning efficiency and personal comprehensive quality ability, and then for the national high-quality maritime talents training, shipping industry development.

2. Practical significance of GPS teaching simulation experiment platform

2.1. Convenience for students to practice

It can break the limitation of time and space and make it more convenient for students to study and practice

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It is presented in the form of a web page. Students only need to open the website on the computer and enter the corresponding account and password to log in to the platform for simulation practice. Compared with the real machine teaching, the simulation experiment platform has better convenience and control. Students can practice anytime and anywhere after class to improve learning efficiency, so as to better master the operation essentials.

2.2. Optimization of classroom students' learning efficiency

Improve the teaching capacity and make students feel more involved

to get rid of the limitations of the real machine, the simulation experiment platform ensures that one person and one account. In the course of class, each student can operate and practice at the same time, and always follow the teacher's thinking, which greatly improves the interaction between teachers and students so that students can better participate in the learning of GPS operation.

The design of the simulation experiment platform is shown in Figure 1

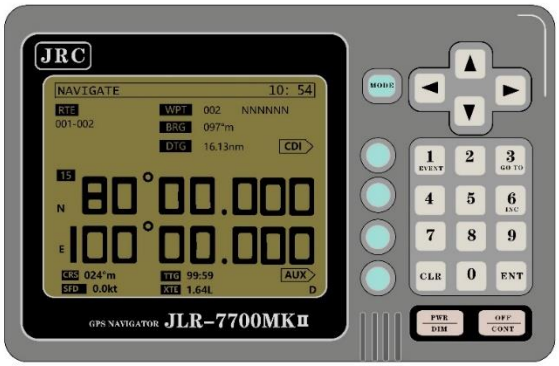

FIG. 1 Design diagram of simulation experiment platform

2.3. Limitations of simulation experiment platform

(1) There may be inconsistency between the real machine and the model of the simulation experiment platform.

There are different models of GPS on ships, and the operation methods of different models are also different. The model used in the simulation experiment platform is JLC-7700MKII[2]. There are also other models of GPS in the market, so the operation mode will be different and there may be inapplicable situation, but we will continue to improve and find ways to optimize this problem. To make the simulation experiment platform that everyone can operate very easily.

(2)The practice application is simple, only applied to GPS simulation exercises.

The simulation experiment platform is only used for GPS operation practice, and there is no operation practice of other equipment, such as AIS, depth sounder and other bridge instruments.

3. Application analysis of GPS teaching simulation experiment platform:

GPS teaching simulation experiment platform has great convenience for students' learning and teachers' teaching. Students' practice degree is improved, and the sense of interaction and participation in teaching is improved, which makes students' learning efficiency and mastery degree. Teachers' teaching comprehensiveness and teaching progress have been greatly improved, so that students can better learn professional knowledge. But GPS teaching simulation experiment platform also has many shortcomings and limitations. The following is the discussion and analysis of the application of the simulation platform:

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To solve the singularity of its system, at present, it is only a simulation experiment platform for GPS, but through the same design concept, other bridge equipment (AIS, sounder, tachometer, gyrocompass, etc.) are designed and developed[3], all of which are connected in series as a whole, which not only solves the singularity of the simulation platform, but also greatly improves the learning convenience of students. "One platform for multi-faceted learning" is also a great innovation for teaching.

In reality, GPS is connected with other instruments and equipment on the bridge (radar, AIS, electronic chart, etc.) to provide data information. Similarly, can the GPS teaching simulation experiment platform also be connected with other bridge simulation systems in some way to build a complete set of ship simulation systems?

It can be directly used in the study and practice of navigation students on campus, and can also be used in the crew training of institutions off campus.

4. Discuss and innovate

At the same time, the increase in capacity greatly improves the interaction rate between teachers and students in the classroom, which also makes the teaching method innovative. At the same time, the teaching is more convenient and efficient, and students can better integrate into the classroom learning. In short, the establishment of GPS teaching simulation experiment platform has a great positive effect on the learning of navigation students, which not only makes students' learning more convenient, but also makes teachers' teaching more efficient.

But at the same time, the GPS teaching simulation system also has some limitations, such as the experimental content is relatively simple, there are some restrictions on the practice of benchmarking equipment, but in the next step, these problems will be further optimized to provide users with more convenience, so that the simulation experiment platform to maximize its efficiency!

5. Conclusion

Through the analysis of the above content, we can see that the main purpose of the design of GPS teaching simulation experiment platform is to provide convenience and efficiency for students to learn, so that navigation students can learn efficiently to improve their personal professional quality, become a modern high-quality navigation talent[5], and provide impetus for the future development of shipping industry!

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