DESIGN BUILD MINI SIMULATOR NAVIGATOR FISH BOAT
(Design and Build Mini Fishing Ship Navigation Simulator)

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ABSTRACT
Navigation simulators have a very important role in the learning process to steer the ship’s motion safely virtually based on the same shape and function as the original. However, the absence of a navigation simulator at the Aceh Marine and Fisheries Polytechnic of the Capture Fisheries Study Program (PTK) is thought to be the cause of the non-optimal learning process so that a navigation simulator is needed. This study aims to facilitate the navigational science learning process so as to make this navigation simulator a teaching and learning tool in the classroom, both in theory and practice. The method of designing and building a mini fishing boat navigation simulator is carried out in three stages, namely the literature review method, the observation method and the field work method. The results obtained are a navigation simulator with compass, radar, electronic maps, steering, weather control, ship lights and sound signals. The building space for this fishing boat navigation simulator can be used as a learning tool to sail ships and can increase interest in learning.

Keywords : Fishing Boad, Navigation, Simulator

ABSTRAK
Simulator navigasi mempunyai peranan yang sangat penting dalam proses pembelajaran mengarahkan gerak kapal dengan aman secara virtual berdasarkan bentuk dan fungsi yang sama dengan aslinya. Namun ketiadaan simulator navigasi di Politeknik Kelautan dan Perikanan Aceh Program Studi Perikanan Tangkap (PTK) diduga menjadi penyebab tidak optimalnya proses pembelajaran sehingga dibutuhkanlah ruang bangun simulator navigasi. Penelitian ini bertujuan untuk memudahkan proses perkuliahan ilmu navigasi sehingga menjadikan simulator navigasi ini sebagai alat bantu belajar mengajar dikelas, baik secara teori maupun praktek. Metode kegiatan rancang bangun mini simulator navigasi kapal ikan ini dilakukan dalam tiga tahapan yakni metode kajian kepustakaan, metode observasi dan metode kerja lapangan. Hasil penelitian yang diperoleh yakni sebuah simulator navigasi dengan fitur kompas, radar, peta elektronik, kemudi, pengaturan cuaca, lampu kapal dan isyarat bunyi. Ruang bangun simulator navigasi kapal ikan ini dapat dimanfaatkan sebagai alat bantu pembelajaran melayarkan kapal dan dapat menambah minat belajar.

Kata kunci: Kapal Ikan, Navigasi, Simulator

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INTRODUCTION

Simulation is the process of implementing a model into a computer program (software) or electronic circuit and executing the software in such a way that its behavior mimics or resembles a real system (Purba., et al: 2017). The characteristics of a simulator are mimicking or resembling a real system (Bambang, 2009). According to Syibli, Y.M and Dedi N (2021) A ship navigation simulator is a tool used to provide an overview to users to make it easier to determine the position and direction of a ship's trajectory. A simulator is said to be of good quality if it meets the criteria of valid, practical and effective (Iqbal, M.M, et al, 2022). The use of simulators as a learning tool is one of the excellent learning methods in providing more meaningful learning to students (Setiyantara, Y, et al. 2018).

Navigation is the process of monitoring and controlling the movement of a person or means of transportation from one place to another (Emmanuel, D., et al, 2013). Santoso, H.B (2021) also argues that to meet work standards on ships, it is necessary to have knowledge to know the state of a terrain that will be faced in order to avoid accidents at sea. The advances in science and technology that we have today, have provided convenience in various voyages. The increasingly modern navigation system makes it easier for us to know the direction of the voyage carefully. We can also find out the position of the ship that is sailing and can be in direct contact with other people so that there is no collision (Faturacman, et al, 2015).

Fishing vessels are vessels specifically used in fishing (Salam, H.A.H., et al: 2017). Types of fish vessels include shrimp trawlers, purse seiners, payang, long liners, poles and liners and others. According to Palembang, S. (2013) the plan for shipbuilding must follow the rules proposed by the Indonesian Classification Bureau (BKI), namely having the strength of the ship's body structure, having the success of fishing operations, having high stability, and having storage facilities for fish catches.

In this regard we want to design a build and create a navigation simulator on a fishing boat. At the Aceh Marine and Fisheries Polytechnic, especially the Capture Fisheries study program (PTK), it does not yet have a navigation simulator, while this still uses simple navigation tools. The simulator that we designed generally has some flexibility in accessing some information related to ship sailing, including related to ship movement, the use of lights in accordance with the regulations for preventing impacts in the sea and pema there are several navigation tools used during sailing activities under various conditions that we want. Therefore we are interested to create a navigation simulator that can be used as we should be in the actual navigation space.

METODE RESEARCH

This applied research was carried out by involving 5 cadets of the Aceh Marine and Fisheries Polytechnic, Capture Fisheries Study Program (PTK). The tools and materials used in this study were 1 piece of Sim Simulator Software, 1 package of MSI GeForce GTX 1650 VGA Card, 4 pieces of 4 GB DDR 2 Ram, 1 1 TB SSD Hard Drive, 1 unit of Ultra Wide Screen.

The applied research activity was carried out on 24-29 May 2021 at the Aceh Marine and Fisheries Polytechnic, Aceh Besar Regency. The method of design and build a mini simulator for navigating fish boats is carried out in the form of: (1) The method of literature study is to find existing information related to this applied research through journals, articles and books. (2) The observation method is to find information in the company and in the market regarding the materials to be used, both the type and selling price and something related to the design of a ship navigation mini simulator. (3) The fieldwork method is by directly descending
RESULTS AND DISCUSSION

The fish boat navigation mini simulator is an auxiliary equipment used in the lecture process so that cadets can easily understand the navigation course before the application is directly shipped. The navigation simulator mini wake room used in this study was designed using Sim Simulator software with MSI GeForce GTX 1650 VGA Card. Some of the features offered in this navigation simulator mini room are a compass, radar, electronic map, rudder, weather settings, ship lights and sound signals. The design is made to resemble an actual ship navigation tool so that prospective cadets are no strangers to ship navigation and can stimulate their psychomotor skills.

This simulator consists of several control panels that serve to control the ship through the virtual. The following are some of the functions of the control panel to build the mini room of the navigation simulator, namely:

The on/off button serves to turn on or off the fishing boat navigation simulator.

![Figure 1. Button Display on/off](image1.jpg)

Cam 1 serves to reveal the inside of the ship

![Figure 2. Front View of the Ship](image2.jpg)
Cam 2 serves to reveal part of the outside of the ship.

![Figure 3. Outer view](image3)

Cam 3 serves to reveal the left part of the ship

![Figure 4. Outer left](image4)

Cam 4 serves to reveal the left part of the ship

![Figure 5. right-hand view](image5)
Cam 5 serves to reveal the left part of the ship

![Figure 6. Driving Boat D from outside](image)

He serves to mmsound signals

![Figure 6. He Display](image)
Mini jantra serves for Uto drive the ship.

![Image of Mini Jantra](image1)

**Figure 7. Display Mini Jantra**

The gas lever (throttle) functions for Mback and forth and speed of the vessel.

![Image of Gas Lever](image2)

**Figure 8. Display Gas Lever**

Putro S, et al (2016) stated that in ancient times when they wanted to determine the direction of shipping, they used celestial bodies such as the sun and stars. This is not an easy thing to understand and not everyone is able to do it, especially when coupled with unfavorable weather conditions (Widyaningsih, U. 2022). In modern times, this is rarely used because it already has various sophisticated navigation systems. To learn these various navigation systems, cadets can be helped by the use of navigation simulators. The navigation simulator also provides more practice with various conditions for real. This is in accordance with the statement of Anggoro, P.D.W., (2018) namely that virtual navigation interaction allows navigation movements to run relatively freely and diversely in a real space whose conditions can be limited.

The navigation simulator mini wake room in the study was specially designed to control the ship virtually. The things that will be studied are determining the position of the ship, determining the ship’s mileage, determining the ship’s travel time and knowing the presence or absence of collision hazards that will occur between our ship and other ships. The use of this navigation simulator serves to overcome the limitations of learning aids on the campus of the Aceh Marine and Fisheries Polytechnic, Aceh Besar Regency, making it easier for cadets to be familiar with various navigation tools on real ships. This was also stated by Hartanto, C.F.B (2018), namely that navigation simulators can improve the knowledge and navigation skills of sailing academy cadets. This is evidenced by the increase in quality graduates who can be used in the world of work.
Based on the results of trials on prospective cadets, this navigation simulator mini-building room increases learning motivation. This can be seen from the pleasant learning atmosphere and material that is easy for prospective cadets to understand. The advantage of using this navigation mini simulator building space is that it makes it easier for students to carry out practices related to navigation, especially in ship movement. Navigation simulators are also a means of supporting the lack of facilities and infrastructure. This navigation simulator mini building room can also provide an experience with diverse ship conditions compared to the real environment and can make students more concerned about the material presented. while the weakness is that it is still in two-dimensional form and must be continuously updated until it becomes three-dimensional.

Conclusion
The design of this mini fish boat navigation simulator can be used as a learning tool for sailing a ship by cadet students of the Aceh Marine and Fisheries Polytechnic, Capture Fisheries Study Program (PTK).

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