Utilizing Dataisland to Create Interactive Maritime English Exercises

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Abstract – **The paper is devoted to the use of new platform to secure, process and store data (Dataisland). The advantages of using Dataisland are listed in the research. It is highlighted that the platform helps Maritime English teachers to develop interactive exercises which could be useful to form communicative competence of future seafarers. Strong security measures are provided to protect created content, the updates are periodical.**

Keywords – **artificial intelligence; maritime professionals; e-learning; digitalization.**

I. INTRODUCTION

With the advent of artificial intelligence (AI), there is a growing need to equip teachers with the necessary skills to integrate AI tools into the teaching process effectively [1]. As AI-driven technologies become more prevalent in educational settings, teachers must be trained to understand these tools and use them strategically to enhance student learning outcomes. This includes learning to use AI for personalized learning experiences and assessing student performance [2].

AI can support teachers by offering real-time feedback on student work, generating customized learning plans, or helping to identify gaps in student understanding. However, for these benefits to be fully realized, educators must be taught how to navigate and utilize AI platforms, adapt their teaching methods accordingly, and ensure that AI complements, rather than replaces, human-centered pedagogy [3].

Developing a teacher's proficiency in AI will empower them to enhance their teaching methods and provide more personalized learning experiences for their students. By integrating AI tools and technologies into their curriculum, teachers can better analyze student data, identify learning gaps, and create tailored lesson plans to address individual needs. Additionally, AI can assist teachers in grading assignments faster and more accurately, freeing up time for them to focus on developing critical thinking and problem-solving skills in their students [4]. Ultimately, empowering teachers with proficiency in AI will enable them to adapt to the rapidly changing educational landscape and better prepare students for the demands of the future workforce [5].

II. MAIN PART

Dataisland is used by Kherson State Maritime Academy to facilitate the digital transformation of it educational and administrative processes. Specifically, this platform enables the seamless management and integration of large volumes of data, helping maritime institutions to optimize both learning and operational efficiency.

For educational purposes, Dataisland supports the use of AI-driven analytics to track student performance, offer personalized feedback, and assess competency in real-time. This is particularly beneficial in maritime training, where the curriculum often includes complex, practical tasks that require continuous evaluation and improvement. By analyzing data from simulations, tests, and practical exercises, the platform helps instructors identify areas where students may need additional support, thus tailoring the learning experience to each individual's needs [6].

Dataisland can help teachers create tests by providing various question formats, customization options, and instant feedback for grading. Teachers can easily generate multiple-choice questions, fill-in-the-blank questions, and short-answer questions, including multiple-choice, and problem-solving tasks, all of which can be adapted to the unique demands of maritime education and more with Dataisland's user-friendly platform. This tool can streamline the test creation process and make it more efficient for educators [7].

Dataisland can help teachers create tests that are not only efficient but also tailored to the specific learning

needs and objectives of maritime students. By utilizing AI and data analytics, the platform can assist teachers in generating customized assessments that align with course content and the competencies required in maritime professions [8].

Dataisland can analyze the curriculum and learning materials to automatically generate tests that cover key concepts and competencies [9]. Dataisland can help teachers create tests that are not only efficient but also tailored to the specific learning needs and objectives of maritime students. By utilizing AI and data analytics, the platform can assist teachers in generating customized assessments that align with course content and the competencies required in maritime professions.

By tracking student progress over time, Dataisland can create different-level tests for students. The platform uses data on individual performance and learning gaps to develop assessments that challenge students at the right level of difficulty, ensuring that both advanced and struggling students are appropriately assessed [10].

After the tests are completed, Dataisland can automatically grade certain types of questions, such as multiple-choice or true/false, and provide detailed feedback to students. For more complex, open-ended questions, AI-powered algorithms can assist teachers in grading by offering suggestions or identifying patterns in student responses, saving time and ensuring consistency.

Dataisland supports adaptive testing, where the difficulty of questions adjusts based on the student's responses. This approach ensures that students are continuously challenged without being overwhelmed, helping teachers gauge the depth of student understanding more accurately [11].

Teachers can access real-time data on test results, allowing them to identify trends, such as common mistakes or areas where the entire class may be struggling. This data-driven approach enables instructors to make informed decisions about reteaching certain concepts or adjusting the curriculum to address learning gaps.

Since maritime education often involves strict adherence to international standards and certification requirements, Dataisland ensures that the tests teachers create are aligned with regulatory frameworks, such as those set by the International Maritime Organization (IMO) [12]. Teachers can ensure that their assessments meet the necessary guidelines for certifying future maritime professionals.

Teachers can collaborate on test creation within the Dataisland platform by sharing question banks, templates, and test designs with colleagues across departments or even different maritime institutions. This fosters a collaborative learning environment and helps standardize assessments to meet global educational standards.

Here's an example of multiple-choice questions generated by Dataisland on the topic "Types of Ships"

[13]. These questions assess students' understanding of different ship classifications, their uses, and characteristics.

Topic: Types of Ships

1. Which type of ship is specifically designed to transport liquid cargo, such as oil or chemicals?
a) Container ship
b) Bulk carrier
c) Tanker
d) Ro-Ro ship

2. What is the primary purpose of a container ship?
a) To carry passengers across long distances
b) To transport large quantities of liquid cargo
c) To transport goods in standardized containers
d) To carry vehicles and other rolling cargo

3. Which of the following ships is used to transport dry bulk cargo like grain, coal, or iron ore?
a) Passenger ship
b) LNG carrier
c) Bulk carrier
d) Ferry

4. Ro-Ro ships are specifically designed to carry which type of cargo?
a) Bulk cargo
b) Liquid cargo
c) Vehicles and wheeled equipment
d) Hazardous chemicals

5. What is the main feature of a Liquefied Natural Gas (LNG) carrier?
a) It is equipped with special tanks to keep natural gas in a liquid state
b) It carries dry cargo in bulk
c) It transports containerized goods across oceans
d) It is primarily used to carry crude oil and petroleum products

Figure 1.   Example of a test

These questions cover a range of ship types and their primary uses, helping students to differentiate between various ship categories in the maritime industry. The answers provide immediate feedback, and the test can be adjusted based on student performance using Dataisland's adaptive testing features.

Also the Dataisland platform helps Maritime English teachers develop interactive exercises that are highly effective in fostering the communicative competence of future seafarers. In the maritime industry, effective communication is crucial, especially for ensuring safety, coordinating operations, and adhering to international standards such as those set by the IMO [14]. By leveraging the capabilities of Dataisland, teachers can create dynamic, interactive exercises that go beyond traditional teaching methods, engaging students in real-life scenarios where communication is key.

Students can practice communication skills in simulated environments that mirror real-world shipboard situations, for example, students can role-play scenarios like fires, collisions, or equipment failures, where effective communication can be a matter of life and death [15].

Dataisland's AI capabilities provide real-time feedback on students' language use during exercises. For example, after completing an interactive communication exercise, the system can analyze:

- **Pronunciation Accuracy:** highlighting areas where students need improvement.

- **Grammar and Vocabulary Usage:** assessing the proper use of maritime-specific terms and

providing suggestions for alternative phrases [16].

- **Response Time and Clarity:** evaluating how quickly and clearly a student can respond to a situation.

This immediate feedback helps students refine their communication skills more effectively than traditional methods, allowing them to see where they can improve and practice continuously until they reach the required proficiency level.

The platform encourages collaborative exercises where students work together in pairs or groups to solve maritime challenges that require communication. Role-playing scenarios such as the ship's engine cooling system fails, leading to overheating, troubleshooting the ship's oil purifiers, which remove impurities from the fuel or lubricating oil, oversee ballast water exchange to ensure the ship's stability and comply with international ballast water regulations, the steering gear or propulsion system, breaks down etc.

1. **Engine Room Emergency:**
   Scenario: A sudden fire breaks out in the engine room. Students must coordinate with the crew on the bridge, the firefighting team, and other engineers to manage the emergency, contain the fire, and shut down critical systems to prevent further damage.
   Communication Focus: Clear reporting of engine conditions, giving instructions to support firefighting efforts, and coordinating with other departments in a time-critical situation.

2. **Engine Malfunction at Sea:**
   Scenario: While at sea, the main engine suddenly stops due to a mechanical failure. The engineering team must diagnose the issue, communicate with the captain, and perform necessary repairs, all while providing regular status updates.
   Communication Focus: Describing technical problems accurately, explaining repair procedures, and updating the bridge on progress and estimated repair times.

3. **Routine Engine Maintenance:**
   Scenario: During a routine inspection, engineers discover that parts of the engine need to be serviced or replaced. The team must communicate with the chief engineer, coordinate the maintenance schedule, and order parts, ensuring the ship remains operational.
   Communication Focus: Reporting technical assessments, planning maintenance activities with other departments, and explaining potential impacts on ship operations.

4. **Fuel Transfer and Bunkering:**
   Scenario: Engineers need to coordinate the transfer of fuel from one tank to another or during bunkering operations at port. The exercise involves communicating with the deck crew, port authorities, and fuel suppliers to ensure the operation is safe and efficient.
   Communication Focus: Following safety protocols, ensuring proper documentation, and clearly communicating fuel levels and transfer progress.

5. **Pollution Prevention Incident:**
   Scenario: An oil or chemical spill is detected in the engine room, and engineers must work quickly to prevent environmental contamination. The team must notify the bridge, activate containment procedures, and report the incident to authorities.
   Communication Focus: Reporting the environmental incident, detailing the actions being taken, and ensuring compliance with MARPOL regulations.

Figure 2.   Example of a real life situations

These role-playing tasks are essential for developing not only the language skills but also the soft skills needed for teamwork and leadership in maritime operations.

Dataisland allows teachers to design interactive quizzes that assess communicative competence through multimedia formats. These quizzes can incorporate:

- **Audio Clips of Real Maritime Conversations:** students can listen to these clips and answer comprehension questions or engage in follow-up conversations, ensuring

they understand the nuances of spoken Maritime English.

- **Videos of Ship Operations:** teachers can use videos that require students to describe ongoing operations or respond to verbal instructions, simulating real-world communication exchanges [17].

- **Speech Recognition Exercises:** students can practice giving orders or responding to commands, with the platform analyzing their pronunciation and fluency.

To increase engagement, Dataisland incorporates gamified elements into exercises, where students can compete in language challenges, earn points, and progress through different levels of difficulty. Students must respond quickly and accurately to a series of maritime communication scenarios, earning points for speed and precision. Gamification adds a layer of motivation, making the learning process enjoyable and helping students stay engaged while building communicative competence.

The Dataisland platform can analyze each student's progress and adapt exercises to meet their individual needs. If a student struggles with particular phrases or terms used in maritime operations, the system can generate exercises focused on these areas.

Depending on the student's pronunciation or fluency issues, the platform can create tailored speaking drills that focus on improving specific aspects of their communication.

Exercises can be adapted in real-time to gradually increase in complexity as the student's communicative competence improves. This ensures that each student is challenged appropriately and progresses at their own pace, leading to better long-term retention and mastery of Maritime English.

As to the key advantages of using Dataisland for teachers, we can name automated assessment and feedback as Dataisland automates the grading of quizzes, tests, and assignments, saving teachers time on repetitive tasks.

Students receive real-time feedback on their performance, which helps them understand mistakes and improve without waiting for manual grading.

Teachers can incorporate videos, audio clips, and interactive elements into lessons to make learning more engaging, particularly for language or technical subjects.

Teachers can track student progress through detailed performance data, identifying trends, strengths, and weaknesses across individuals and the class. This data helps teachers make informed decisions about reteaching certain concepts, adjusting lesson plans, or providing additional support to specific students.

The platform simplifies the process of creating lessons, quizzes, and tests by offering pre-built

templates and content generation tools. Teachers also can share resources, question banks, and lesson plans with colleagues, share best practices, and collaborate on joint projects, making it easier to exchange ideas and improve teaching methods allowing for the collaborative development of educational materials.

Dataisland provides robust security measures to protect the content created by teachers, ensuring that sensitive data remains secure and accessible only to authorized users. All data transmitted between users (teachers, students) and the Dataisland platform is encrypted using industry-standard encryption protocols (e.g., SSL/TLS). This ensures that data, including lesson plans, tests, and student records, is protected from unauthorized access during transmission.

Dataisland conducts regular updates to its software and security infrastructure to address new vulnerabilities and enhance system protection. These updates are automatically applied to keep the platform secure without disrupting user activities.

III. CONCLUSION

Dataisland empowers maritime educators to create comprehensive, data-driven tests that assess both theoretical knowledge and practical skills. Through automation, personalization, and AI-driven insights, the platform streamlines the test creation process while ensuring that assessments are aligned with the specific needs and requirements of maritime education.

Dataisland platform revolutionizes how Maritime English is taught, providing maritime educators with the tools to create immersive, interactive, and data-driven exercises that build communicative competence. By simulating real-world scenarios, offering real-time feedback, and allowing for personalized learning paths, Dataisland ensures that future seafarers are well-prepared to communicate effectively in high-stakes maritime environments. This ultimately enhances safety, efficiency, and collaboration in global maritime operations.

By using Dataisland, teachers can streamline their teaching processes, create engaging learning experiences, and better support students in achieving their educational goals while enhancing their own efficiency and effectiveness.

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