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# Exploring the Interplay of Authentic Assessment and Instructor Competencies in Enhancing Industry Readiness in Maritime Education

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**Abstract**

In maritime education and training, ensuring the quality of education to prepare seafarers with essential skills for global competitiveness is critical due to the industry's significant role in global trade. This study aims to investigate how authentic assessment strategies and instructor competencies influence the professional outcomes of marine transportation and engineering students, seeking to improve maritime education and align it with industry readiness. Utilizing a descriptive-correlational design, the study was conducted at Dr. Carlos S. Lanting College, involving students enrolled in BS Marine Transportation and BS Marine Engineering programs. The participants included 240 students, predominantly male, aged 18 to 24 years. Data were collected using a structured questionnaire validated by domain experts. The results indicated significant positive correlations between authentic assessment practices, teaching competency, and industry preparedness. Regression analysis showed that both authentic assessment practices ($B = 0.410$, $p < 0.001$) and teaching competency ($B = 0.498$, $p < 0.001$) significantly predict industry preparedness, explaining 79.3% of the variance. These findings highlight the importance of enhancing assessment strategies and instructor competencies to better prepare students for industry demands. Future research should explore the long-term impact of these practices on graduates' career success and consider potential differences across diverse demographic groups within maritime education.

*Keywords: Maritime education, authentic assessment, instructor competencies, industry readiness, professional outcomes, maritime training*

## Introduction

In the field of maritime education and training (MET), the search for guaranteed quality education preparing seafarers with the essential skills as globally competitive in the shipping industry is paramount. The shipping industries are responsible for over 80 percent of the world's trade (*Review of Maritime Transport 2021 (Overview)*, 2021); thus, it is crucial for maritime educational institutions to develop and enhance these essential skills and professionalism. It is imperative for the Maritime Higher Education Institution, in partnership with the shipping companies, to instill practical competencies adhering to the strict guidelines set by the International Maritime Organization (IMO) and International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) 1978, as amended (International Maritime Organization, 2019; JCMMC No. 01, 2019).

In the field of education, the influence of the instructors is significant to the students' learning outcomes is universally acknowledged (Ingraham et al., 2018; Kang & Im, 2013; Kim et al., 2011; Schrodt et al., 2009). The quality of teaching and instruction has a direct impact on the academic achievements and experiences of students, as influenced by teachers' competencies, including knowledge, abilities, attitudes, values and beliefs. Embracing a wide spectrum from the subject matter expertise to pedagogical, socio-cultural, emotional, and technological aspects, these competencies play a significant role in the development of students, equipping them not only for the present but also for the rapidly evolving future. In higher education, authentic assessment is progressively more acknowledged for its profound impact on improving student learning, engagement, and professional or industry preparedness across multiple disciplines (Conway, 1997; Ghosh et al., 2017, 2020; A. O. James & Adewale, 1857; Maxwell, 2012; Sokhanvar et al., 2021a; Sotiriadou et al., 2020; Vu & Dall'Alba, 2014). These teaching and instructional strategies not only enhance the learning experience by equipping students with essential future career opportunities skills but also challenge traditional assumptions about motivation, and promote active, engaged learning activities. Whether it is action research in teaching practice, interactive structured oral exams, or real-world project assessments in engineering and business, authentic assessment methods have been proven to improve significantly and improve student satisfaction, success and retention, thereby preparing them more comprehensively for their future careers.

Concurrently, the concept of authentic assessment surfaces as a crucial element in Maritime Education and Training (MET), with the goal of bridging the knowledge gap between theory and practice (Ghosh et al., 2014, 2017, 2020). In order to prepare maritime students for the intricacies of their future professional efforts, authentic assessment entails tasks mirroring real-world challenges in the maritime industry. Research indicates strong support for the implementation of authentic assessment fosters heightened student engagement, creativity, and deeper comprehension of the subject matter, thereby contributing to a workforce that is well-equipped to meet the laborious demands of the maritime industry (Ghosh, 2018; Sokhanvar et al., 2021b; Villarroel et al., 2018).

However, a conspicuous research gap lies in comprehensively understanding and integrating these two pivotal elements – the instructor competencies and the authentic assessment methods (González-Pérez & Ramírez-Montoya, 2022; González-Salamanca et al., 2020). This study aims to delve into this intricate interplay, exploring how the synergy between instructors' competencies in teaching methodologies and authentic assessment strategies shapes the industry readiness of maritime students, thereby contributing to a robust and competent maritime workforce ready to tackle the challenges of the future.

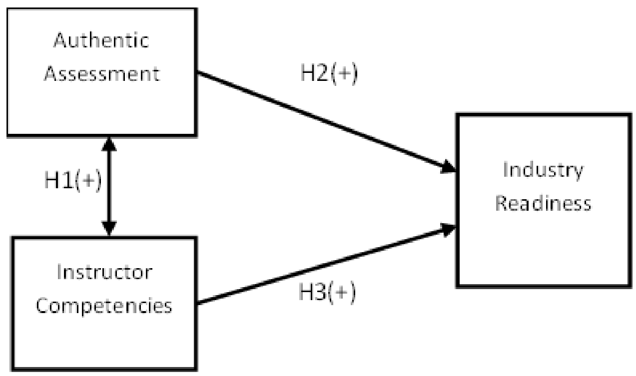
## Objectives of the Study

This study aims to investigate the influence of authentic assessment strategies and instructor competencies on the professional outcomes of marine transportation and engineering students. Assess the combined impact of these factors, aiming to improve maritime education and develop a framework aligning academic excellence with industry readiness. Specifically,

1. Examine how authentic assessment relates to instructor competency in maritime education, testing if better assessments improve instructor skills.
2. Investigate if higher instructor competency levels correspond to increased industry readiness among

maritime students.
3. Explore the influence of authentic assessment on maritime students' industry preparedness, determining if improved assessments enhance their readiness for the industry.
4. Assess how both authentic assessment and instructor competency together affect industry preparedness in maritime students, testing if enhancements in both areas have a greater impact on readiness than either alone.

**Research Paradigm and Hypotheses of the Study**




The study explored the intricate relationship between instructors' competencies in teaching methodologies and authentic assessment strategies, examining how this synergy influences the industry readiness of maritime students. Using a developed simulacrum, authentic assessment and instructors' competencies were visually interconnected, reflecting their mutual influence, while the industry readiness, the dependent variable, was depicted as connected to these factors, illustrating their impact. This representation serves as a valuable tool for comprehending the dynamic interaction between these components, emphasizing their reciprocal relationship and collective impact on students' readiness for the maritime industry. Despite its simplicity, the simulacrum provides insights into the theoretical framework of the study, though it may not fully capture the complexity of the relationships or account for potential moderating factors.

This graphical representation not only facilitates a clearer understanding of the theoretical framework but also offers empirical support for the following hypotheses.

**(H1+):** There is a significant positive correlation between the level of Authentic Assessment implementation and the level of Instructor Competency in maritime education programs.
**(H2+):** There is a significant positive correlation between the level of Instructor Competency and the Industry Preparedness of maritime students.
**(H3+):** There is a significant positive correlation between the level of Authentic Assessment implementation and the Industry Preparedness of maritime students.
**(H4+):** The combined effect of Authentic Assessment and Instructor Competency on Industry Preparedness is significantly positive.

**Methodology**

*Research Design.* In this study, the researcher utilized the descriptive-correlational design, which aims to determine the relationship between authentic assessment, instructor competencies, and industry preparedness of the BS Marine Transportation and BS Marine Engineering students.

*Respondent of the Study.* The participants of the study will be the enrolled students of Bachelor of Science in Marine Transportation and Bachelor of Science in Marine Engineering at Dr. Carlos S. Lanting College.

*Instrument.* Data collection in this study will be conducted using a structured, researcher-designed questionnaire crafted specifically to explore various facets of maritime education. The instrument comprises four sections, beginning with demographic inquiries to establish a contextual foundation for analysis. The second section assesses students' perceptions of authentic assessment practices, guided by Lean and Barber (2022), ensuring that items reflect real-world maritime scenarios and industry standards via a five-point Likert scale. Instructor competencies are evaluated in the third section through the Teaching Competencies Scale (TCS), revised in alignment with Swank et al. (2021) to cover a comprehensive range of knowledge, skills, behaviors, and dispositions pertinent to maritime education. The final section gauges students' self-assessed readiness for the maritime industry, incorporating competencies crucial for the Fourth Industrial Revolution as identified by Gadalla (2022), including technological proficiency and adaptability.

The reliability of the research instruments was assessed using Cronbach's Alpha, yielding the following results: Overall Industry Preparedness (Cronbach's Alpha = .976, 15 items), Overall Authentic Assessment Practices (Cronbach's Alpha = .975, 16 items), Overall Teaching Competency (Cronbach's Alpha = .981, 25 items), and All Items (Cronbach's Alpha = .990, 56 items). These high values indicate excellent internal consistency, demonstrating that the instruments used in the study are reliable for measuring the constructs of interest. Additionally, the content of these instruments was validated by research experts in the field, ensuring that they accurately captured the constructs of authentic assessment, instructor competencies, and industry preparedness.

*Data Gathering Procedure***.** The data gathering procedure for this study was systematically organized to ensure the utmost validity and reliability of the collected data, alongside comprehensive analysis. Initially, the research instrument, a structured questionnaire, undergoes a stringent internal validation process where a panel of domain experts in maritime education and research methods evaluates the relevance, clarity, and thoroughness of the questions. This is aimed at ensuring the precise capture of the constructs of authentic assessment, instructor competencies, and industry preparedness. Following this, the questionnaire was subjected to external validation through a pilot study with a representative segment of the target population to fine-tune the instrument based on the feedback received.

Once validated, the questionnaire is distributed to a carefully chosen sample of marine transportation and engineering students. The distribution channels, potentially encompassing both digital (e.g., email, educational platforms) and physical means, are selected based on their accessibility and anticipated response rates. Detailed instructions accompany the questionnaire to ensure respondents understand the study's purpose and how to complete the questionnaire accurately.

During the data collection phase, the research team diligently monitors response rates, engaging with participants as necessary to motivate participation and clarify any ambiguities related to the questionnaire items. To ensure a robust data set for analysis, efforts are concentrated on achieving a high response rate. After the data collection, a structured deadline for submission is enforced, complemented by reminders to encourage timely responses. For physical distributions, specific sessions are organized for the collection of the completed questionnaires.

*Data Analysis.* The collected data are methodically entered into a data analysis software (SPSS), followed by meticulous data cleaning procedures to ensure accuracy and consistency. This step involves checking and rectifying any missing values, outliers, or inconsistencies in the responses.

Finally, with a clean and comprehensive dataset in hand, various statistical methods appropriate for the study's design are employed to analyze the data. These methods are chosen to unravel the intricate relationships between authentic assessment strategies, instructor competencies, and students' academic performance and industry readiness, ultimately contributing to a rich, insightful, and actionable set of research findings.

## Results and Discussion

### 1. Respondents Profile

**Table 1**
*Respondents Profile*

| Indicators | | Frequency | Percentage |
|---|---|---|---|
| Age | 18.00 | 16 | 6.7% |
| | 19.00 | 51 | 21.3% |
| | 20.00 | 30 | 12.5% |
| | 21.00 | 77 | 32.1% |
| | 22.00 | 28 | 11.7% |
| | 23.00 | 23 | 9.6% |
| | 24.00 | 15 | 6.3% |
| | Total | 240 | 100.0% |
| Sex | Male | 239 | 99.6% |
| | Female | 1 | .4% |
| | Total | 240 | 100.0% |
| Year Level | 1st year | 74 | 30.8% |
| | 2nd year | 57 | 23.8% |
| | 3rd year | 109 | 45.4% |
| | Total | 240 | 100.0% |
| Program | BS Maritime Transportation | 158 | 65.8% |
| | BS Maritime Engineering | 82 | 34.2% |
| | Total | 240 | 100.0% |

The demographic profile of the respondents (N = 240) indicates a predominantly young cohort, with ages ranging from 18 to 24 years, and the majority being 21 years old (32.1%). The sample is overwhelmingly male (99.6%), reflecting the gender imbalance in maritime programs. Year level distribution shows a higher concentration of students in advanced stages, with 45.4% in their third year. Additionally, 65.8% are enrolled in the Bachelor of Science in Maritime Transportation, while 34.2% are in Maritime Engineering. This diverse demographic profile provides a comprehensive context for analyzing the influence of authentic assessment strategies and instructor competencies on the professional outcomes of marine transportation and engineering students.

### 2. Correlations between variables

The means (M) and standard deviations (SD) indicate high levels of Industry Preparedness (M = 4.052, SD = 0.803), Authentic Assessment Practices (M = 4.164, SD = 0.817), and Teaching Competency (M= 4.159, SD = 0.827) among the respondents. The correlation analysis reveals significant positive relationships among all three variables. Industry Preparedness is strongly correlated with both Authentic Assessment Practices (r = .844, p < .01) and Teaching Competency (r = .860, p < .01).

**Table 2**
*Means, standard deviations, and correlations of the variables of the study*

| | M | SD | 1 | 2 | 3 |
|---|---|---|---|---|---|
| 1. Industry Preparedness | 4.052 | 0.803 | 1.000 | | |
| 2. Authentic Assessment Practices | 4.164 | 0.817 | .844** | 1.000 | |
| 3. Teaching Competency | 4.159 | 0.827 | .860** | .833** | 1.000 |

*** Significant at .05 level of alpha*
*** Very significant at .01 level of alpha*

The means (M) and standard deviations (SD) indicate high levels of Industry Preparedness (M = 4.052, SD = 0.803), Authentic Assessment Practices (M = 4.164, SD = 0.817), and Teaching Competency (M= 4.159, SD = 0.827) among the respondents. The correlation analysis reveals significant positive relationships among all three variables. Industry Preparedness is strongly correlated with both Authentic Assessment Practices (r = .844, p < .01) and Teaching Competency (r = .860, p < .01). Similarly, there is a significant positive correlation between Authentic Assessment Practices and Teaching Competency (r = .833, p < .01). These findings suggest that higher levels of authentic assessment practices and teaching competency are associated with better industry preparedness among marine transportation and engineering students, highlighting the critical role of these educational strategies in enhancing students' readiness for professional environments (Esqueda-Merino et al., 2023).

## 3. Key Predictors of Industry Preparedness in Maritime Education

**Table 3**
*Regression analysis predicting industry preparedness (N=240)*

| | Unstandardized Coefficients | | Standardized Coefficients | t | p |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | .275 | .128 | | 2.149 | .033 |
| Authentic Assessment Practices | .410 | .053 | .417 | 7.804 | .000 |
| Teaching Competency | .498 | .052 | .512 | 9.579 | .000 |

*Note. Constant=0.275, F(2,237)=452.983***, p<.01, R2=793*

The regression analysis demonstrates that both Authentic Assessment Practices and Teaching Competency are significant predictors of Industry Preparedness among marine transportation and engineering students. The model explains a substantial portion of the variance in Industry Preparedness, with an $R^2$ of .793, indicating that 79.3% of the variability in Industry Preparedness can be accounted for by these two predictors.

Authentic Assessment Practices have a significant positive effect on Industry Preparedness (B = 0.410, β = 0.417, t = 7.804, p < 0.001), suggesting that improvements in authentic assessment practices are associated with higher levels of industry preparedness. Similarly, Teaching Competency also has a significant positive effect on Industry Preparedness (B = 0.498, β = 0.512, t = 9.579, p < 0.001), indicating that higher teaching competency is linked to better industry preparedness.

The significant F-value ($F(2, 237) = 452.983$, $p < .01$) confirms that the regression model is a good fit for the data. These results underscore the importance of enhancing authentic assessment strategies and teaching competencies to improve the industry readiness of students in maritime education programs.

The results of this study provide substantial support for the proposed hypotheses, underscoring the interconnected roles of authentic assessment implementation and instructor competency in shaping the industry preparedness of maritime students.

Firstly, the significant positive correlation between Authentic Assessment Practices and Teaching Competency (H1+) highlights the intrinsic link between these two educational dimensions. The findings suggest that higher levels of authentic assessment implementation are associated with enhanced instructor competency (Ghosh, 2018; Ghosh et al., 2014, 2017). This relationship can be attributed to the nature of authentic assessments (Darling-Hammond & Snyder, 2000; Frey et al., 2019; Koh, 2017), which require instructors to engage in continuous improvement and innovation in their teaching methodologies (Lin & Han, 2017; Yan-rong, 2010). By implementing diverse and practical assessment strategies, instructors can develop a deeper understanding of the subject matter and refine their pedagogical skills, leading to higher competency levels.

Secondly, the study confirms the significant positive correlation between Teaching Competency and Industry Preparedness (H2+). This indicates that improvements in instructor competency directly enhance students' readiness for the industry (Harper & Webster, 2017; Hashim, 2024). Competent instructors are better equipped to deliver comprehensive and relevant education (Mallam et al., 2019; Manuel, 2017), thereby providing students with the necessary skills and knowledge to meet industry demands (Borah et al., 2019; Jing et al., 2011; Pascail, 2006). This finding underscores the critical role of instructor quality in shaping the professional outcomes of maritime students.

Thirdly, the significant positive correlation between Authentic Assessment Practices and Industry Preparedness (H3+) emphasizes the importance of practical and real-world assessment strategies in preparing students for professional environments (Jopp, 2020; Soderman, 2016). Authentic assessments, which simulate industry scenarios and challenges (Mattison et al., 2020; Sam et al., 2022), help students develop critical thinking (Ashford-Rowe et al., 2014; Damayanti et al., 2017), problem-solving (Connolly, 2014; Mierluş-Mazilu & Yilmaz, 2024), and practical skills (Palmer, 2012; Sokhanvar et al., 2021b). As a result, students who undergo such assessments are better prepared to transition from academic settings to the industry(Adela García-Aracil et al., 2018; Jopp, 2020; Madeleine Schultz et al., 2021; Sokhanvar et al., 2021b).

Lastly, the regression analysis supports the hypothesis that the combined effect of Authentic Assessment and Instructor Competency on Industry Preparedness is significantly positive (H4+). The model explains a substantial portion of the variance in Industry Preparedness, indicating that these two factors together have a powerful impact on students' readiness for the industry. The findings suggest that an integrated approach, which simultaneously enhances assessment practices and instructor competency (Kandemir et al., 2018; Zlatkin-Troitschanskaia & Pant, 2016), can significantly improve the overall quality of maritime education and better prepare students for their future careers (A. J. James et al., 2018; Sellberg & Lundin, 2018; Vujičić et al., 2020).

This study highlights the critical interplay between authentic assessment implementation and instructor competency in fostering industry preparedness among maritime students. By focusing on these areas, maritime education programs can enhance their effectiveness and better align academic excellence with industry readiness. Future research should explore the long-term impact of these educational practices on graduates' career success and investigate potential differences in outcomes across diverse demographic groups within the maritime education sector.

## Conclusions

This study aimed to investigate the interconnected roles of authentic assessment implementation and instructor competency in shaping the industry preparedness of maritime students. The findings reveal significant positive correlations between Authentic Assessment Practices and Teaching Competency, Teaching Competency and Industry Preparedness, and Authentic Assessment Practices and Industry Preparedness. Furthermore, the combined effect of Authentic Assessment and Instructor Competency significantly impacts Industry Preparedness, explaining a substantial portion of its variance. These results suggest that enhancing assessment practices and instructor competency can significantly improve the overall quality of maritime education and better prepare students for their careers.

However, this study is not without limitations. The primary limitations include the sample size and potential methodological constraints, which may have influenced the results. Future research should consider addressing these limitations by expanding the sample size and employing diverse methodologies, such as longitudinal studies, to enhance the robustness of findings in this area. Moreover, further studies could explore the long-term impact of these educational practices on graduates' career success and investigate potential differences in outcomes across diverse demographic groups within the maritime education sector.

In conclusion, this research contributes to the understanding of the critical interplay between authentic assessment implementation and instructor competency in fostering industry preparedness among maritime students. These findings underscore the importance of focusing on these educational dimensions, offering a foundation for future exploration and practical advancements in maritime education.

## Recommendations

Maritime education programs should enhance authentic assessment practices by incorporating diverse assessment methods and continuous feedback mechanisms. Improving teaching competency through professional development and mentorship programs is essential. The curriculum should be aligned with industry standards and include soft skills training. Strengthening collaboration with maritime companies through internships and guest lectures can provide valuable industry exposure. Regular assessment of educational strategies and the use of data analytics for evidence-based decision-making will help ensure continuous improvement. For future research, it is recommended to explore the long-term impact of these educational practices on graduates' career success and industry adaptability, as well as to investigate the potential differences in outcomes across diverse demographic groups within the maritime education sector. These measures will significantly enhance students' industry preparedness and professional outcomes.

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