Teachers' Competence and Curriculum Integration as Predictors of the Implementation of Sustainable Development Goals for Quality Education

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ABSTRACT

The low implementation of Sustainable Development Goals (SDG) for Quality Education is a growing concern. This study aimed to determine the significance of teachers' competence and curriculum integration as predictors of implementing sustainable development goals for quality education. Using the descriptive correlational design, involving 350 respondents selected through random sampling, and it was revealed that teacher competence and curriculum integration significantly influence the implementation of SDG for quality education, affirming the Total Quality Management in Education Theory. It is recommended that all educational institutions initiate programs and activities to improve teacher competence and curriculum integration to ensure the implementation of quality education. Likewise, further research utilizing other variables not covered in this study, in order to determine the variants in implementation of SDG quality education.

Keywords*:* teacher competence, curriculum integration, implementation of sustainable development goals, quality education

INTRODUCTION

Implementing Sustainable Development Goals (SDGs) for quality education has faced significant challenges worldwide (Zickafoose et al., 2024). For example, several studies indicate a generally low implementation of SDGs globally (Sachs et al., 2024), highlighting the widespread difficulty in achieving these goals. This issue is particularly evident in various parts of the world, prompting regional efforts to address the gaps. For instance, Thailand and the United States convened to review and improve the application of SDG in some higher education institutions due to its low implementation (Chang & Lien, 2020; Sampantami et al., 2020). The same relevant findings in Central Philippines determined that the implementation of SDG in some institutions is, unfortunately, low (Albert et al., 2023; Violanda et al., 2023). This recognizes the urgent need for collective action to enhance education quality and accessibility.

Moreover, the poor implementation of SDGs for quality education remains unaddressed, jeopardizing the integration of sustainability principles into teaching, research, and campus operations (Leal Filho et al., 2020). This highlights the urgency of investigating this issue. Compounding this urgency is the limited research on implementing SDGs for quality education. Accordingly, this study is undertaken to address these critical gaps.

This research is anchored on Edward Deming's Total Quality Management in Education Theory, which emphasizes efficient resource utilization, successful institutional system operation, and the overall quality and efficiency of education, including the establishment of equal opportunities for each student (Sallis, 2014). In the context of this study, the teacher's competence variable—indicated by ensuring quality education and lifelong learning, offering innovative learning experiences, and developing skills for a sustainable future (Sinakou et al., 2022)—represents efficient utilization, as conceptualized in Deming's theory. The curriculum integration

variable—reflected in interdisciplinary learning for sustainable development, multidisciplinary teaching, and real-world experiences through holistic education (Cottafava et al., 2019)—symbolizes the effective operation of the institutional system. Lastly, the implementation of sustainable development goals—demonstrated through applied implementation strategies and transformative collaboration—corresponds to the quality and efficiency of education, as discussed by Odell et al. (2020).

Conceptual Framework

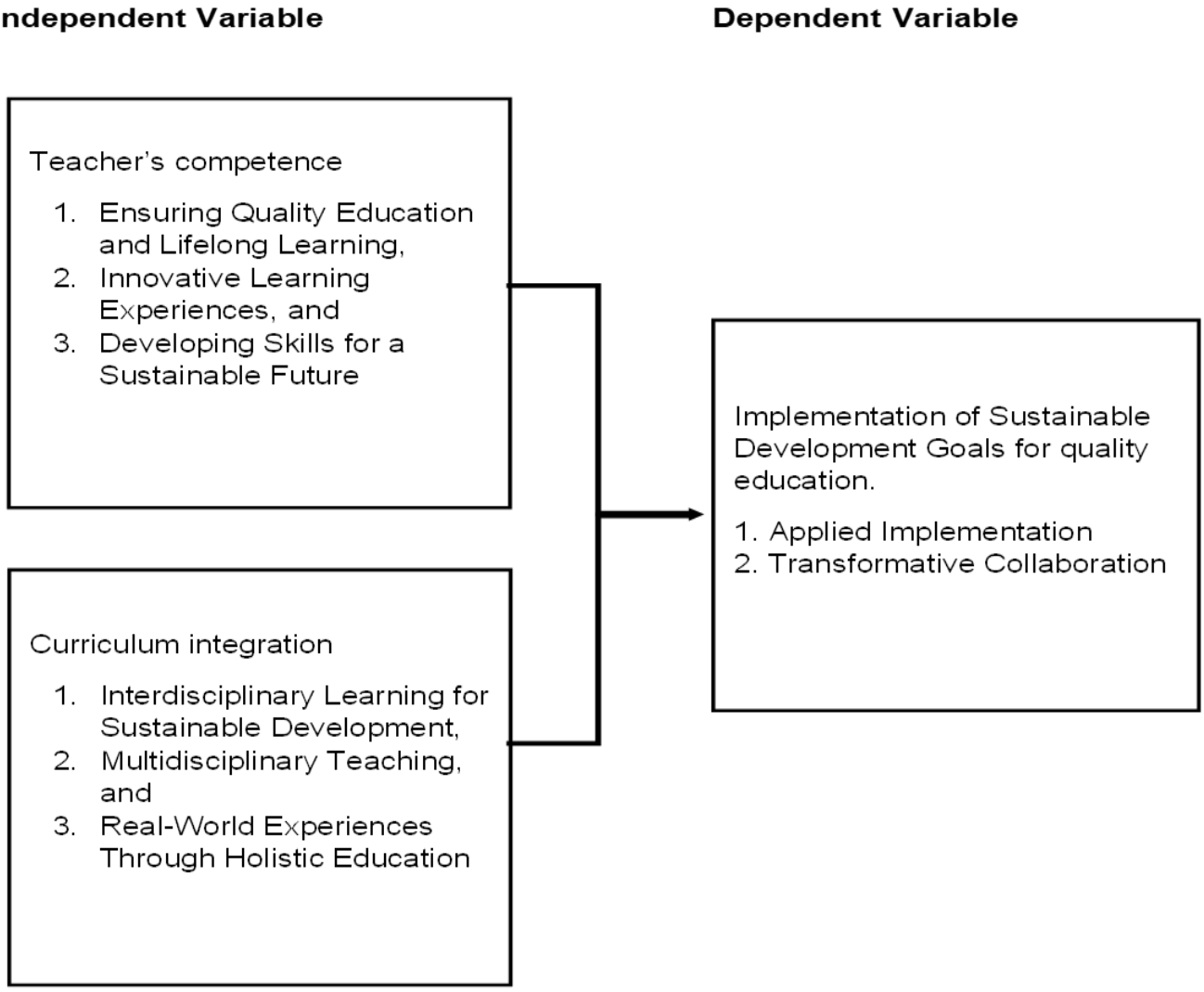

Figure 1. Conceptual Framework of the Study

Research Objectives

This study aimed to determine the significance of teacher's competence and curriculum integration as predictors of the implementation of Sustainable Development Goals (SDGs) for quality education. Specifically, it sought to answer the following research questions: first, it aimed to determine the levels of teacher's competence as perceived by the respondents in terms of ensuring quality education and lifelong learning, innovative learning experiences, and developing skills for a sustainable future. It also sought to determine the level of curriculum integration in the implementation of sustainable development goals for quality education, focusing on interdisciplinary learning for sustainable development, multidisciplinary teaching, and real-world experiences through holistic education. In addition, the study aimed to assess the level of implementation of sustainable development goals for quality education in terms of applied implementation and transformative collaboration. Second, it intended to determine the significance of the relationship between teacher competence, curriculum integration, and the implementation of sustainable development goals for quality education. Lastly, the study aimed to determine the significance of the influence of teacher competence and curriculum integration on the implementation of sustainable development goals for quality education.

The hypotheses were tested at a 0.05 level of significance. The first null hypothesis (H_{o1}) stated that there is no significant relationship between teacher's competence, curriculum integration, and the implementation of SDG for quality education. The second null hypothesis (H_{o2}) stated that there is no significant influence of teacher's competence and curriculum integration on the implementation of SDG for quality education.

METHODOLOGY

Research Respondent

The respondents of this study were randomly selected students from Davao Oriental State University, located in Mati City, Davao Oriental, Region XI. The university offers 21 academic programs. A total of 350 respondents were chosen from a population of 3,900 students who had completed the Social Science 10 course, using the Raosoft sample size calculator with a 5% margin of error and 95% confidence level. Inclusion criteria covered all college students regardless of age, religion, beliefs, employment, income, field, or department. A probability sampling method ensured equal selection chances, with the study focusing on institutional and instructional aspects rather than individual characteristics.

Materials and Instrument

This study employed three sets of survey questionnaires to collect data. The first set was developed by Donche and Petegem (2022) and measures teachers' competence. The second set, which assesses curriculum integration, was designed by Cavaglià and Corazza (2019). The third set, authored by Molthan-Hill, Martin, and Sterling (2020), evaluates the implementation of Sustainable Development Goals (SDGs). To ensure the validity and reliability of these instruments, they were subjected to content validity assessment and reliability testing. As Heale and Twycross (2015) noted, validity ensures that data collection accurately reflects the intended investigation. Additionally, to align the instruments with the respondents' cultural context, a panel of experts in questionnaire construction reviewed and refined them accordingly. The reliability of each variable was assessed using Cronbach's Alpha, ensuring internal consistency across all indicators.

The research instrument had to undergo pilot testing to ensure reliability, addressing the stability and consistency of measurement. The results showed the following Cronbach's Alpha coefficients: teacher's competence (α= 0.992), curriculum integration (α = 0.989), and implementation of SDG (α = 0.983), indicating internal consistency measure of the statements.

The study employed a five-point Likert scale, a widely used tool for measuring perceptions, to assess teacher competence, curriculum integration, and the implementation of Sustainable Development Goals (SDGs) related to quality education. The scale ranged from 1.00 to 5.00, with descriptive equivalents and interpretations as follows: 4.20–5.00 (Very High) indicated excellent performance; 3.40–4.19 (High), very good; 2.60–3.39 (Moderate), good; 1.80–2.59 (Low), poor; and 1.00–1.79 (Very Low), very poor. This rating system was consistently applied across the evaluation of teacher competence, curriculum integration, and SDG implementation to ensure uniform interpretation of results.

Design and Procedure

This study utilized a quantitative-descriptive This study employed a correlational methodology to examine the relationship between teacher competence, curriculum integration, and the implementation of Sustainable Development Goals (SDGs) in higher education. A descriptive component was also included to provide a snapshot of current conditions by observing behaviors without manipulation (Larsson et al., 2020). This combined approach was appropriate for analyzing how teacher ability and curriculum integration impact SDG implementation. Regression analysis was used to quantify and predict these relationships, providing a solid basis for addressing the study’s objectives.

Data were collected through a systematic process. First, the researcher secured an endorsement letter from the Graduate School Dean, which was then submitted to the administration of a university in Davao Oriental to obtain formal permission to conduct the study. Following this, an orientation was given to participants, and

informed consent and assent were obtained electronically before they accessed the survey. The survey was conducted online for ease and accessibility and included three sections. It was designed to be anonymous and voluntary to protect participant confidentiality.

The administration of the survey took place in February, during the third quarter of the school year 2024–2025. Before the survey was distributed, the researcher explained its purpose to the participants to ensure full understanding. Students were given one hour to complete the questionnaire, and the researcher remained available throughout the session. Completed surveys were collected immediately afterward. Data were then checked, encoded into Excel, and submitted to a statistician for analysis. The researcher interpreted the analyzed data for the results and discussion section.

The statistical tools used included mean and standard deviation to determine levels of teacher competence, curriculum integration, and SDG implementation. Pearson's r was applied to measure the relationships among these variables, while regression analysis assessed the individual and combined effects of curriculum integration and planning on teacher competence. This formed the foundation for developing a regression model.

Ethical considerations were addressed through a thorough review by the Society for Integrity and Legal Ethics (SMILE). Recognizing that some participants may be minors, the researcher implemented safeguards such as assent forms and ensured voluntary, non-coerced participation. These measures reflect a strong commitment to ethical research, legal compliance, and academic integrity.

RESULTS AND DISCUSSION

This chapter contains the descriptive analysis of the data of the variables involved in the study, the correlation analysis between predictive and criterion variables, and the regression analysis of predictive variables on the criterion variable.

Descriptive Analysis

Table 1 is a descriptive table. It contained the level of Teacher's Competence, Curriculum Integration, and Implementation of Sustainable Development Goals for Quality Education.

Table 1. Descriptive Table.

Variables	SD	Mean	Descriptive Leve
Teacher's Competence	**1.02**	**4.07**	**High**
Ensuring Quality Education and Lifelong Learning	1.06	4.09	High
Innovative Learning Experiences	1.04	4.08	High
Developing Skills for a Sustainable Future	1.03	4.05	High
Curriculum integration	**1.00**	**4.02**	**High**
Interdisciplinary Learning for Sustainable Development	1.04	4.02	High
Multidisciplinary Teaching	1.02	4.01	High
Real-World Experiences Through Holistic Education	1.02	4.03	High
Implementation of Sustainable Development Goal for Quality Education	**0.99**	**3.96**	**High**
Applied Implementation	1.00	3.94	High
Transformative Collaboration.	1.02	3.99	High

4.20-5.00 Very High, 3.49-4.19 High, 2.60-3.39 Moderate, 1.80-2.59 Low, 1.00-1.79 Very Low

Table 1 shows that teacher competence in delivering quality education and promoting sustainable learning received a high average score of 4.07 (rated "High" within the 3.40–4.19 range). This indicates that teachers demonstrate strong capabilities in supporting the implementation of Sustainable Development Goals (SDGs), particularly in ensuring quality education and lifelong learning. Teachers' ability to connect content to students' prior knowledge is key to creating equitable and engaging learning experiences.

Meanwhile, the implementation of SDGs for quality education obtained a mean score of 3.96, also rated as "High," but it ranked the lowest among the factors assessed. This suggests that although SDG-related initiatives are present, they are inconsistently applied and not fully embedded in institutional structures. This gap points to the need for better alignment of SDG implementation with university policies, goals, and academic frameworks. Strengthening institutional commitment in this area will allow HEIs to have a more meaningful impact on sustainable development.

Among all indicators, teacher competence received the highest rating, underscoring its essential role in promoting quality education and lifelong learning. This highlights higher education institutions' (HEIs)

prioritization of faculty expertise. Competent teachers can design innovative learning experiences and foster student engagement in sustainability-focused courses. Corres et al. (2020) affirmed that educator competence is vital for transforming education through a multidisciplinary, transparent, and goal-aligned approach to sustainable development. Almazroa et al. (2022) similarly emphasized that competent teachers are more effective at integrating SDG-related concepts into instruction, research, and community service—fostering a culture of sustainability within institutions (Dhaka, 2024).

These findings contradict Burn's (2020) assertion that teacher competence is becoming less critical due to students' increasing access to self-directed digital learning (Hamad et al., 2022; Charokar & Dulloo, 2022). On the contrary, the study affirms that skilled educators remain central to delivering impactful sustainability education.

However, the lower score in SDG implementation suggests that HEIs may not be fully capitalizing on teacher competence to drive systemic change. While faculty are prepared to incorporate sustainability principles into their teaching, institutional frameworks may be lacking. Twyford et al. (2024) argue that individual teacher competence is insufficient without institutional prioritization of SDG targets. Leal Filho et al. (2023) also noted that without consistent reflection of SDGs in academic policies, strategies, and interdepartmental collaboration, implementation will remain limited.

In conclusion, while teachers are well-equipped to promote sustainability education, higher education institutions must reinforce institutional support and align faculty expertise with broader strategic goals. Greater collaboration and a unified institutional commitment are crucial for the successful integration of SDGs across all levels—academic, administrative, and operational.

Correlation Analysis

Table 2 is the correlation table. It presents the relationship between teacher's competence and curriculum integration and the implementation of sustainable development goals in HEI.

Table 2. Correlational Table

Variables	Pearson r-value	p-value	Decision on Ho	Interpretation
Teacher's Competence and Implementation of Sustainable Development Goals for Quality Education	0.869	0.000	Reject	Significant
Curriculum integration and Implementation of sustainable development goals for Quality Education	0.922	0.000	Reject	Significant

Table 2 presents the results of the correlation analysis between curriculum integration and the implementation of Sustainable Development Goals (SDGs) for quality education. With a p-value of 0.000, the correlation is statistically significant, leading to the rejection of the null hypothesis. This confirms a meaningful relationship

between curriculum integration and SDG implementation, where the strong positive correlation indicates that curriculum integration plays a central role in the successful execution of SDG initiatives within higher education institutions (HEIs).

This finding underscores the crucial role of curriculum integration in advancing sustainability efforts in education. Embedding sustainability principles into academic programs directly contributes to the effectiveness of SDG implementation, making curriculum integration a key driver rather than a supporting factor. As curriculum integration improves, so does the impact of SDG-related activities (Abdullah et al., 2025), supporting previous studies that advocate for the inclusion of sustainability themes across disciplines to foster a strong sustainability culture in HEIs (Leal Filho et al., 2023; Adhikari & Shrestha, 2023).

Additionally, curriculum integration enhances teacher competence in sustainability education. When sustainability is embedded into course content, educators are encouraged to expand their knowledge, refine their teaching strategies, and engage more deeply with SDG topics (Havea & Mohanty, 2020; Mack & Downs, 2024). This ongoing professional development bridges the gap between theory and practice (Almazroa et al., 2022), enabling educators to better prepare students for real-world sustainability challenges. In this way, curriculum integration not only supports SDG implementation but also strengthens educator effectiveness (Buerkle et al., 2023), contradicting Zguir et al.'s (2022) claim of a weak or negative correlation.

In conclusion, the findings affirm that curriculum integration is critical to the successful implementation of SDGs in HEIs. Incorporating sustainability themes across curricula empowers students, educators, and the wider community to take meaningful action toward achieving global goals. Future research should explore effective strategies for curricular integration and how HEIs can adapt their approaches to maximize sustainability impact.

Regression Analysis

Table 3 is the regression table. It shows the independent variables, namely, teacher competence and curriculum integration. Likewise, it contains the implementation of sustainable development goals as the dependent variable.

Table 3. Regression Table

Predictor	Estimate	Stand. Estimate	SE	t	p	Decision on Ho	Interpretatic
Intercept	0.25		0.09	2.89	0.004		
Teacher's competence	0.11	0.11	0.05	2.08	0.039	Reject	Significant
Curriculum integration	0.81	0.82	0.05	14.92	0.000	Reject	Significant
R= 0.923,	R^2= 0.851,	Adjusted R^2=0.850,		F=992.0,	Sig.=0.000		

Table 3 presents the results of the regression analysis examining the relationship between teacher competence, curriculum integration, and the implementation of Sustainable Development

Goals (SDGs) for quality education. The analysis reveals a very strong positive correlation, with teacher competence and curriculum integration collectively explaining 85.1% of the variance in SDG implementation. The model produced a highly significant p-value (0.000), indicating a strong fit and confirming that these two variables have a substantial and reliable impact on achieving SDG 4 within higher education institutions (HEIs).

This suggests that as teacher competence and curriculum integration increase, the success of SDG-related initiatives in HEIs improves significantly. As Hermann and Bossle (2020) observed, while curriculum integration provides the institutional framework, competent educators are crucial for effectively delivering sustainability content and inspiring student engagement. These two factors work synergistically to amplify the overall impact

of sustainability efforts.

The strong explanatory power of the model supports similar findings from Gamage et al. (2022), emphasizing that advancing teacher training and curriculum design can lead to notable progress in embedding sustainable practices across HEIs. Institutions that proactively revise curricula and invest in educator development are more likely to realize tangible improvements in their sustainability outcomes (Altassan, 2023; Araci et al., 2025). This further affirms that the association between these predictors and SDG implementation is both meaningful and robust—not a product of random variation.

Given these results, HEIs should prioritize teacher competence and curriculum integration as foundational elements of strategic sustainability planning. Strengthening faculty training and embedding sustainability across academic programs (Kyamogi & Mawela, 2024) supports a holistic approach to SDG implementation (Maki, 2023). These findings also directly challenge Žalėnienė and Pereira's (2021) claim that institutional culture outweighs competence and integration. While factors such as student engagement (Filho et al., 2024) and resource constraints (Serafini et al., 2022; Albuquerque, 2023) remain relevant, this study demonstrates that competence and curriculum design are critical enablers of sustainability.

In conclusion, the findings provide compelling evidence that teacher competence and curriculum integration are essential drivers of SDG implementation in higher education. Their significant impact highlights the need for HEIs to embed these elements into institutional policies and programs. Future studies should investigate specific strategies and frameworks that most effectively support these efforts across diverse educational settings.

CONCLUSION

Based on the findings, it is concluded that teacher competence and curriculum integration predict the implementation of sustainable development goals. This conclusion fully affirms the Total Quality Management in Education Theory by Edward Deming, which underscores the efficient utilization of resources, successful operation of the institutional system, and quality and efficiency of education, including the establishment of equal opportunities for every student.

RECOMMENDATIONS

Based on the conclusion, it is recommended that all educational institutions initiate programs and activities to improve teacher competence and curriculum integration to ensure the implementation of quality education. Further research utilizing other variables not covered in this study is needed to determine the variants in the implementation of SDG for quality education.

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