Original Research Article

ACTION COMPETENCE TOWARDS ENVIRONMENTAL CITIZENSHIP OF COLLEGE OF TEACHER EDUCATION STUDENTS

ABSTRACT

This correlational study investigated the relationship between action competence and environmental citizenship in the context of teacher education. A sample of 324 teacher education students enrolled during the Second Semester of School Year 2022 - 2023 at the University of Mindanao, Philippines were selected as respondents, and they completed a modified survey instrument that collected data on their levels of action competence and environmental citizenship. The analysis of descriptive statistics using mean scores revealed high levels of both action competence and environmental citizenship. The results also determined teacher education students' willingness to act and sustainability as key indicators of their action competence and environmental citizenship, respectively. Pearson's r correlation coefficient value of $r = .688$ ($P= .000$) showed a significant positive relationship between the two variables indicating that students with higher levels of action competence were more likely to exhibit environmental citizenship behaviors. These findings suggest that action competence is an important factor in fostering environmental citizenship among teacher education students. The researchers described these results in relation to their implications for curriculum design, pedagogical approaches, and policy development, highlighting the importance of integrating sustainability education into teacher preparation programs to nurture action competence and empower future educators to contribute effectively to sustainable development efforts.

Keywords: sustainable development, environmental citizenship, action competence, willingness to act, teacher education students, Philippines

1. INTRODUCTION

The world faces an array of pressing environmental problems, each with far-reaching consequences for planetary health and the future. Among these challenges, climate change, resource depletion, and biodiversity loss stand out as particularly severe, posing a significant threat to human survival on Earth [1]. Changes in one part of the world can have ripple effects elsewhere, as environmental challenges are inherently linked with broader societal issues such as poverty, inequality, and conflict [2]. The efforts towards achieving environmental goals have largely been failing around the world. Therefore, the focus must shift to mitigation and adaptation [3].

Addressing these challenges requires a paradigm shift in how individuals and communities perceive and embrace environmental citizenship, which can play a crucial role in achieving sustainable development.

Raising environmental citizenship competencies primarily happens in environmental education, a critical foundation for environmental skills and values. According to Mihail and Mihaila [4] the focus on a new paradigm shift should be empowering citizens to make informed decisions and develop a valued personal responsibility for the sustainable use and protection of the environment. This can be achieved through targeted educational and capacity-building literacy projects that improve citizen understanding of environmental issues and the interconnectedness of human and natural values [5]. Sustainable initiatives highlighting active citizenry consistently establish environmental citizenship as a critical and foundational approach.

Consequently, Parra, Hansmann, Hadjichambis, Goldman, Paraskeva-Hadjichambi, Sund, and Gericke [6] reinforce the significance of environmental citizenship as a relevant indicator of pro-environmental behavior, serving as a transformative bridge between passive awareness and result-oriented engagement. However, the effectiveness of these programs in fostering environmental citizenship remains a significant concern. Bourn [7] underscores the significance of several factors influencing the success of these programs in addressing contemporary environmental issues, including the quality of the programs and the adequacy of teacher training, along with the need for a paradigm shift toward sustainability. Understanding the current level of environmental citizenship among teacher-education students is crucial. Investigating the development of their competencies and action

skills related to social, civic, and environmental responsibility is vital for measurable outcomes [8] [9].

In looking for effective ways to integrate critical citizenship with environmental responsibility, the approach in environmental citizenship research focuses on action-based learning. Adombent, Hiller, and Fröhlich [10] found evidence that implementing environmental projects intended to develop their environmental citizenship was an effective approach to bring about direct changes in their sustainable behavior. In a study conducted in Portugal, researchers [11] were able to determine the skills, most prominently cooperation, problem-solving, and causal reasoning, among students in seeking sustainable solutions after being exposed to environmental citizenship-oriented projects. Hence, providing opportunities for action and exhibiting a greater sense of interconnection and interdependence strongly deepens the connection to environmental values.

Through a combination of different methods, the dynamic interplay between education and hands-on involvement reinforces the connection between environmental responsibilities and active citizenship. According to Ariza, Boeve-de-Pauw, Olsson, Parra, Van Petegem, and Gericke [12], the most significant aspect of environmental citizenship that needs to be at the heart of the educational training is to teach curriculum in action, i.e., linking the school curricula with environmental goals and culminating goals into transferable outcomes. Likewise, Wals and Jickling [13] emphasize the importance of participation in sustainability-related activities as a critical aspect of environmental citizenship. Therefore, establishing a reliable framework for evaluating action competence significantly contributes to the understanding of a teacher's ability to effectively demonstrate action in the context of citizenship.

Research has previously established a connection between action competence, environmental citizenship, and outcomes for pro-environmental behavior. A study discovered [14] that university students who identified as environmental citizens were more inclined to democratic participation in conservation and sustainable practices, such as joining environmental organizations. However, educational policies and frameworks should explicitly address and promote practices that empower individuals to take meaningful environmental action.This leads to a key insight from Chen and Wu [15] that confirmed individuals who possessed higher levels of action competence were more likely to demonstrate environmental citizenship, and this connection was explained in part by their degree of environmental experience.

More importantly, citizenship programs and action-oriented approaches must be designed to achieve specific and measurable goals that can be implemented. Husamah, Suwono, and Dharmawan [16] highlighted many projects that emphasize people and communities implementing environmental action, such as natural renovation work, policy initiatives, and democratizing science education. In addition, environmental citizenship has helped to raise awareness about environmental issues and increase public engagement in the environmental decision-making process. Seery and Hassouna [17] also confirmed that better environmental understanding, involvement, and maintain commitment have resulted in the development of active agents of change advocating environmental conservation within environmental education programs.

Environmental citizenship encompasses various core dimensions, and one relevant aspect involves understanding the factors that influence action towards engaging in pro-environmental behaviors. Stern, Dietz, Abel, Guagnano, and Kalof [18] introduced the values-beliefs-norm theory to explain the underlying motivational

factors for active participation in addressing environmental issues within the context of citizenship. This theory situates individuals' environmental decisions a actions are shaped by their personal values, their own beliefs, and the prevailing environmental attitudes of their social circles. Evidently, the framework has been used in research to explore how these factors impact pro-environmental behavior, as demonstrated by Homburg, Stolberg, and Wagner [19] in their study of German adults, where they found that environmental values and beliefs have a strong relationship with concrete conservation and environmental actions.

Specifically, a broad discourse on shaping the identity of a citizen and developing a direct capacity to act as social change agents presents immense challenges for education. For Erlina [20], there is evidence that warrants progressive improvement of action competence among teacher candidates, which can be measured through strategies directed to help realize their students' action-oriented outcomes. Additionally, Nugroho, Permanasari, and Firman [21] recommend the development of evaluation models based on sustainable development to promote the spirit of collective action competence consistently and systematically in the educational context. This focus on the role of teacher candidates as catalysts of enabled action reflects the potential to establish a relational framework of citizenship using an action-oriented approach.

Moreover, existing research on environmental citizenship has never elaborated on any components of critical citizenship education, indicating the need for a more informed understanding to successfully integrate civic participation and collective action into environmental education practices [22] [23]. Besides, environmental research highlights the ongoing discussion concerning the action results of environmental citizenship, which might develop toward conflicting social action

agendas. Significantly, stakeholders such as lawmakers, environmental groups, and educators have sought clear proof of meaningful, action-oriented environmental gains for over a decade. These gaps present a significant challenge for adopting solutions that effectively position action-project components in developing a citizenry equipped and motivated toward improved environmental outcomes.

The study significantly contributes to improving educational institutions by emphasizing the growing impact of environmental citizenship. Schools embracing these principles can enhance teacher training and professional development programs, empowering educators to cultivate environmental citizenship among students. Administrators can benefit from valuable insights on seamlessly integrating action-oriented environmental citizenship education into their curriculum, fostering sustainable educational outcomes. Subsequent research should focus on innovative pedagogies and curriculum frameworks for environmental citizenship education.The research has also identified gaps in exploring certain critical aspects of the educational process. Identified gaps in exploring critical aspects of education warrant future investigations to broaden the conceptualization of environmental citizenship, including vital skills like critical thinking.

It is crucial to conduct research that explores the connection between action competence and environmental citizenship among teacher education students to effectively redefine citizenship in the context of sustainability and education.Therefore, the main objectives of this study are to assess the level of environmental citizenship and action competence among teacher education students, and to investigate the potential significant correlation between these two variables. The research aims to provide valuable insights into sustainability and education, ultimately guiding the development of strategies to cultivate environmental citizenship among future

educators. This improved understanding will lead to more effective programs that promote responsibility and sustainability-oriented choices, fostering collaborative growth among teachers, schools, and students asenvironmental citizens.

2. METHODS

2.1. Respondents

The study comprised a sample of 324 teacher education students from the University of Mindanao-Main's College of Teacher Education during the Second Semester of the Academic Year 2022-2023. The sample size was determined using the Raosoft calculator, ensuring a representative subset of the total population of 2,050 students. Convenience sampling was employed to select the sample, as it was deemed appropriate given the limited access to resources and the focus on an accessible group of teacher education students. This approach is supported by Hahn, DeWalt, Baker, and Schillinger's [24] view that it can be a practical and viable choice for exploratory research, especially when investigating potential correlations between variables. The inclusion criteria for respondents required them to be full-time students enrolled in any teacher education programs. Non-education students taking education courses as unit earners were excluded.

2.2.*Research Instruments*

To address the research question of this study, two modified survey instruments were employed in the study: The Environmental Citizenship Scale [25] and the Self Perceived Action Competence for Sustainability Questionnaire [26].

The Environmental Citizenship Scale (ECS) is a self-report instrument designed to measure the level of environmental citizenship in terms sustainability, participation, and

responsibility as key indicators of environmental citizenship behavior.The original version comprised 24 items distributed among 4 indicators. However, this study employed a modified version of the survey instrument, using only 17 items and excluding one indicator.Thisadjusted scale proved reliable and valid for determining the environmental citizenship levels of teacher education students with a Cronbach Alpha score of $\alpha = .96$, denoting a very high reliability. Consequently, the survey construct received validation from experts, confirming its appropriateness for the research objectives.

The level of environmental citizenship was assessed using a Likert scale value range allocation adopted from Gümrükçüolu, Sarimehmet, and Hintistan [27]. A score of 4.20-5.00 on the scale suggests a very high level of consistent environmental citizenship, while a score of 3.40-4.19 indicates a high level of frequent environmental citizenship. A score of 2.60-3.39 suggests a neutral level of fair environmental citizenship, whereas a score of 1.80-2.59 indicates a low level of rare environmental citizenship. Finally, a score of 1.00-1.79 suggests a complete lack of environmental citizenship at a very low level. The instrument was deemed a reliable and valid measurement tool for assessing the environmental citizenship levels of teacher education students.

The Self Perceived Action Competence for Sustainability Questionnaire (SPACS-Q) is a measurement scale designed to assess individuals' self-perceived ability and confidence to engage in sustainable actions.The SPACS-Q typically consists of a series of Likert-scale items, where teacher education students indicate their degree of agreement or confidence regarding their competence in sustainable actions.The present study modified the instrument by utilizing 17 items from the original scale distributed across three key indicators: knowledge of action possibilities, confidence in own influence, and willingness to act. The instrument reliability was established with a high Cronbach Alpha value of $\alpha = .97$,

affirming its high level of reliability. Additionally, expert validations concurred, providing satisfactory agreement on the validity of the construct being measured.

Action competence levels are interpreted using a Likert scale approach adopted from Gümrükçüolu, Sarimehmet, and Hintistan[27]. A score within the range of 4.20-5.00 signifies consistent action competence at a very high level. Following this, a score falling between 3.40-4.19 indicates frequent action competence at a high level. In the middle range, a score from 2.60-3.39 reflects fair action competence at a neutral level. Conversely, a score of 1.80-2.59 suggests rare action competence at a low level. Finally, a score of 1.00-1.79 denotes a complete absence of action competence at a very low level.Thus, the measurement tool was acknowledged as valid and reliable, offering a trustworthy means of determiningaction competence levels in teacher education students.

To accurately determine the correlation between the variables, the study adopted Dacey and Reidy [28] interpretation guidelines of Pearson's r correlation coefficient. First, a correlation coefficient ranging from 0.00 to 0.19 reflects a very weak correlation, suggesting an almost negligible relationship between the two variables. Next, the coefficient ranging from 0.20 to 0.39 reflects a weak correlation, suggesting a slight relationship that lacks substantial significance. Then, the coefficient ranging from 0.40 to 0.59 reflects a moderate (positive or negative) correlation, suggesting a discernible relationship between the variables. A coefficient ranging from 0.60 to 0.79 reflects a strong correlation, suggesting a significant relationship between the variables. Lastly, a coefficient ranging from 0.80 to 1.00 indicates a strong correlation, suggesting ahighly significant relationship between the variables.

2.3. Design and Procedure

To satisfy the research objectives of determining whether a significant relationship exists between action competence and environmental citizenship, the researchers

employed a descriptive-correlational research design. This design is recognized as useful in environmental psychology research by Steg and E. van den Berg [29], who used a correlation coefficient to determine the strength and direction of the relationship between two variables. The primary statistical tool used was Pearson's r correlational coefficient, with a significance level of 0.05 for testing the null hypothesis. Descriptive statistics, such as mean and standard deviation, were also used to determine the levels of action competence and environmental citizenship among teacher education students.

Prior to the implementation of data collection, permission was sought and granted from the Dean of the College of Teacher Education, University of Mindanao. The data gathering process took place within the school premises through in-person surveys, allowing for direct collection of responses for each survey form. During the data gathering procedure, respondents were provided with a comprehensive consent form outlining the study purpose, benefits, and assurances regarding the privacy and anonymity of their personal data. Moreover, the researchers explained that respondents are given the opportunity to willingly engage in the study after fully understanding the details presented in the consent form.

The researchers organized raw scores into a spread sheet for overall action competence and environmental citizenship scores as well as a separate indicator scales. Subsequently, the raw dataset was submitted to a statistician proficient in utilizing the SPSS (Statistical Package for the Social Sciences) software tool. The statistician performed computations for descriptive statistics on each variable and their measurements, as well as the correlation coefficient between variables. The findings were comprehensively interpreted and presented in the findings and discussion section, forming the basis for the researchers' conclusions. The practical implications of the study were also explored,

considering how the results might inform policy choices or enhance practices in relevant domains.

Acknowledging the potential influence of social desirability and biases on respondents, resource limitations, such as time and budget constraints, may have curtailed the comprehensiveness of data collection. Nonetheless, the successful attainment of the target sample size justifies the representativeness of the responses. Moreover, the researchers faced challenges, particularly regarding the willingness of selected respondents in the data-gathering process. To ensure accuracy and verification, a vital step involved thorough data cleaning which involved cross-verifying information with respondents to identify and address outliers, missing values, or inconsistencies. Employing these protocols minimized the impact of bias in the data collection and significantly enhanced the overall data quality.

3. RESULTS AND DISCUSSION

3.1. Level of Action Competence of Teacher Education Students

Table 1 presents the mean and standard deviation scores for action competence among teacher education students as well as the three key indicators of the variable: knowledge of action possibilities, willingness to act, and confidence in own influence. The analysis revealed that a notably high mean score for action competence (M = 4.27, SD = 0.461). This result means that a very high level of action competence was consistently demonstrated by teacher education students, implying that these students are adept at taking well-informed actions that can result in tangible and positive environmental improvements.

Further analysis of the action competence indicators revealed that teacher education students exhibit the highest mean score in terms of willingness to act (M = 4.42, SD = 0.584), indicating a very high level that teacher education students are committed and eagerness to perform action competences, making choices supporting environmental well-being. The confidence in their own influence as an indicator had the lower mean score (M = 4.10; SD = 0.576) suggesting only a high level that while teacher students whose impact may not match those with higher influence levels, these students possess a notable capacity to frequently effect change to some degree

Table 1
Level of action competence among teacher education students (N = 324)

Indicators	*Mean*	*SD*
Knowledge of Action Possibilities	4.32	0.511
Confidence in Own Influence	4.10	0.576
Willingness to Act	4.42	0.584
Overall	**4.27**	**0.461**

The observed very high level of action competence aligns with prior research from Ottesen and Skjelbred [30] who noted a similar uptrend in action competence among future teachers with the skills to respond effectively and ethically to a wide range of environmental concerns. The significance of the high level of action competences is indicative of the growing emphasis on reducing environmental challenges through incorporating action-oriented approaches. The result also resonates with the work of Hsu and Sandberg [31], which specified that high levels of action competence reflect a balanced perspective of one's ability to influence change. In other words, those who exhibit high action competence

consistently use skills to develop and implement well-thought-out plans and adjust strategies as needed.

Furthermore, the result showing a very high level of willingness to act as an indicator of action competence among teacher education students reflects the results from Sikder and Das [32] that revealed the potential of sustainability initiatives to proactively address issues through future teachers who are willing to be advocates for positive change in the environmental and educational system. Moreover, the significance of a high willingness to act extends beyond individual actions, resonating with the research of Carley and Christie [33]. In extension, individuals demonstrating a strong willingness to act are more inclined to participate in civic and local community activities. Hence, cultivating a collective responsibility and a shared commitment among teacher-education students promotes concerned and engaged citizens.

Although not achieving very high levels, the result indicating only a high level of confidence in their own influence among teacher education students aligns with Nousheen, Zia, & Waseem's [34] assertion that future teachers may assume fewer leadership roles, impacting the confidence aspect of action competence. Nonetheless, teacher students with consistent action competence must have the confidence to effectively serve as role models and leaders, guiding their students toward becoming engaged individuals. Improving confidence may be necessary for teacher-education students to assume leadership roles in addressing environmental issues, leading to active participation in initiatives [35].

3.2. Level of Environmental Citizenship of Teacher Education Students

Table 2 shows the mean and standard deviation scores for environmental citizenship among teacher education students and the measures of the variable:

participation, sustainability, and responsibility. The analysis revealed a high mean score for environmental citizenship (*M = 4.14, SD = 0.531*), indicating that teacher education students frequently demonstrated a high level of environmental citizenship. Accordingly, the result signifies that a high level of environmental citizenship among teacher education students contribute to a more holistic and inclusive approach to environmental education.

The result on sustainability as indicator of their environmental citizenship had the highest mean score (*M = 4.23, SD = 0.609*), indicating a very high levels of sustainability among teacher education students who consistently engage in sustainable practices. Meanwhile, responsibility as an indicator of environmental citizenship has had the lowest mean score (*M = 3.97, SD = 0.700*), suggesting that teacher education students only have a neutral level of responsibility that they fairly engage in responsible practices but there is significant potential for improving the level of responsibility in terms of environmental citizenship.

Table 2
Level of environmental citizenship among teacher education students (N = 324)

Indicators	*Mean*	*SD*
Participation	4.18	0.601
Sustainability	4.23	0.609
Responsibility	3.97	0.700
Overall	**4.14**	**0.531**

The observed high level of environmental citizenship among teacher education students aligns with findings from Song, Zhang, & Jiang [36] that strong environmental citizenship among teachers reflects genuine engagement with environmental concerns. The significance lies in their proactive motivation to actively seek and cultivate sustainable solutions, emphasizing a commitment to positive environmental actions and problem-

solving within the educational context. Indeed, high levels of environmental citizenship might well contribute to broader civic campaigns [37]. Therefore, the consistent engagement of teacher education students in high levels of environmental citizenship holds substantial promise for mitigating and pushing toward environmental reforms.

The results showing a high level of sustainability and participation among teacher education students have significant implications, as consistent with Hurlimann and Wallace [38] that emphasized involving local perspectives in decision-making fosters a more environmentally conscious community. The recognition of comprehensive solutions to complex environmental issues, evident in the high sustainability levels, underscores the essential role of participation from local communities. When addressed effectively, engaging diverse stakeholders in addressing environmental challenges and aligning educational efforts with community perspectives offer a holistic but also transparent environmental approach.

The low mean score for the indicator of responsibility aligns with the results of Begum [39], who found that while students exhibit a high degree of environmental consciousness, some were less inclined to take responsibility for addressing problems as a result of a lack of perceived personal influence.This is mainly due to the belief that their actions have no significant impact on the environment. Similarly, teachers who value environmental protection do not feel empowered to make a difference, which often prevents them from taking action. Developing foundations for personal agency and empowerment is crucial in promoting positive change and fostering a sense of responsibility towards the environment.

3.3.*Correlation between Action Competence and Environmental Citizenship*

Table 3 presents the results of a correlation analysis examining the relationship between action competence and environmental citizenship among teacher education

students. The Pearson r correlation coefficient of *r = .688 (P = .000)* suggests a statistically significant positive relationship between action competence and environmental citizenship. Moreover, the low p-value *(P = .000)*indicates that the null hypothesis can be confidently rejected at the 0.05 significance level, confirming the statistical significance of the relationship. Therefore, as the level of action competence increases, the level of environmental citizenship levels among teacher education students also increases.

The observed correlation between action competence and environmental citizenship aligns with previous research of Kalpićand Milković [40] and Haddock, Zimmerman, and Griffith [41] who closely investigated that those who are capable of manifesting a higher degree of action competence are more inclined and participative in pro-environmental behaviors. The capacity to comprehend environmental issues, coupled with the ability to take informed and effective actions, appears to foster a heightened citizen engagement that contribute positively to sustainable change [42]. Therefore, this correlation aligns with the broader goal of environmental citizenship, which emphasizes active and informed participation in initiatives that lead to measurable improvements in the environmental landscape.

Table 3
Correlations between action competence and environmental citizenship (N = 324)

Action Competence	**Environmental Citizenship**			
	Participation	Sustainability	Responsibility	**Overall**
Knowledge of Action Possibilities	.496*	.447*	.314*	.501*
Confidence in Own Influence	.604*	.495*	.540*	.652*
Willingness to Act	.523*	.510*	.346*	.550*
Overall	.655*	th.852*	.489*	**.688***

*P = .05

Moreover, findings underscore the pivotal role of action competence in shaping environmentally responsible behaviors in teacher education development. Research from Diaz, Ribeiro, and Alvez [43] research on environmental education corresponds to the observed correlation, pointing out that strategies for greater action competence through education and training can equip educators to embody strong levels of environmental citizens. Therefore, nurturing action competence among teacher education students, who are future educators, emerges as a pivotal strategy for fostering environmental citizenship within both classrooms and broader communities.

Although the relationship between action competence and environmental citizenship appears significant, a correlational study from Tiefebeck, Staake, and Ares [44] has revealed that the link was not as direct and flawless, because those identifying as environmentally conscious, engaging in pro-environmental behaviors, can surprisingly show a higher carbon footprint than less environmentally conscious individuals. The phenomenon, known as moral licensing, helps explain such insight, wherein individuals who participate in pro-environmental actions believe they have "earned" the right to engage in environmentally harmful behaviors.In the context of teacher education students and environmental citizenship, these insights emphasize the importance of delving deeper into the motivations and consequences of environmentally conscious actions.

The observed correlations among the indicators of action competence and environmental citizenship also warrant further investigation. Notably, confidence in own influenceemerged as the indicator with the strongest correlation of *r = .652 (P = .000),* suggesting a significant relationship with environmental citizenship. This aligns with Ojala and Bengtsson [45] assertion that higher self-confidence is positively associated with the adoption of more sustainable solutions. Despite having the lowest mean score among the

action competence indicators, the significant correlation underscores the importance of exploring how self-confidence in one's influence might intricately contribute to environmental citizenship among teacher education students.

To determine the significant relationship between action competence and environmental citizenship confirmed the theoretical expectations of the values-beliefs-norm theory [18]. Furthermore, the identified correlation emphasizes the interconnectedness of these constructs, reinforcing the idea that informed action is integral to the development of environmentally conscious individuals within the educational context. In essence, by infusing the perspective of the norms-values-beliefs with the link between action competence and environmental citizenship, a higher capacity for understanding, analyzing, and taking informed actions in environmental matters corresponds with a greater likelihood of actively participating in initiatives contributing to environmental well-being.

In summary, the study's key finding is that action competence plays a crucial role in fostering environmental citizenship among future educators. The research reveals that teacher education students have a high level of action competence and inclination towards environmental citizenship, but the results show a research need so that they can improve their confidence and sense of responsibility. The study suggests that combining action competence with environmental citizenship can enable future teachers to find creative solutions and take advantage of new opportunities in addressing sustainable development. The results highlights the practical significance of shaping educational curricula and environmental initiatives to foster a generation of educators and citizens actively contributing to environmental well-being.

4. CONCLUSION AND RECOMMENDATIONS

4.1. Conclusions

The present research found evidence that reveals a significant relationship between action competence and environmental citizenship among teacher education students. The research also investigated the level of the two variables and found that both were at significantly high levels. In particular, the evidence points out that teacher candidates demonstrate consistent action competence in terms of willingness to act, and knowledge of action possibilities, but show the need for improvement of confidence in their own influence. Correspondingly, the findings also show that teacher education students have a strong inclination towards environmental citizenship in terms of sustainability and participation; their responsibility, however, needed improvement. Based on these results, the researchers determined that teacher-education students who have a high level of action competence have the knowledge, skills, and attitudes necessary to be effective environmental citizens.

The study highlights the importance of certain qualities for teacher education in environmental citizenship. Combining action competence with environmental citizenship allows teacher education students to teach their students about environmental issues and how to take action. Action competence is also key to finding creative solutions and addressing sustainable development. Teacher education students with a strong sense of environmental citizenship have a deeper connection with the environment, but demonstrating responsibility remains a crucial skill to be developed. Having environmentally responsible teacher education students presents an opportunity to build a society that proactively engages in sustainable development practices.

To determine that action competence correlates strongly with environmental citizenship concurrently validates the values-beliefs-norm theory [18], which explains the motivation of people who value and believe that their actions can contribute to

environmental improvement and reflect their citizen action towards socially responsible behaviors.These motivated actions can be driven by various competencies, including environmental consciousness, ethical considerations, and a sense of responsibility towards future generations. The alignment of the theory and evidence contributes to the present understanding of environmental citizenship and the relational aspects of pro-sustainable behavior with more applied competencies such as action competence into teacher training programs and curricula to empower educators with the knowledge and skills necessary to inspire the next generation of environmental stewards.

4.2. Recommendations

The recommendations are based on the findings of the study that give potential on a number of programs and targeted interventions, specifically for teacher education programs, to further enhance environmental citizenship and action competence levels among teacher education students. Considering the significant correlation between action competence and environmental citizenship among teacher education students, the researchers recommend integrating environmental education and action competence training into teacher education programs and curricula.Environmental education programs can take on numerous shapes in practice, and the researchers recommend those that emphasize action-oriented methods for direct connection with the environment.

Enhancing teacher education students' confidence can be achieved through well-designed programs, including immersive field trips and outdoor education experiences. Structured field trips could expose students to diverse environmental scenarios, fostering hands-on learning and problem-solving. Outdoor education programs might incorporate interactive activities, encouraging students to apply theoretical knowledge in practical situations. Additionally, incorporating mentorship components or partnerships with

experienced educators in environmental education can provide guidance and boost confidence. By tailoring these programs to offer both theoretical understanding and practical application, teacher education students can develop the self-efficacy needed to effectively teach environmental education.

The researchers also propose fostering collaborations with environmental advocacy groups and government agencies to expand opportunities for teacher education students to bolster their environmental citizenship. These partnerships could involve joint workshops, community projects, and participation in government-led environmental initiatives. Establishing these collaborations would not only provide students with hands-on experiences but also enhance their understanding of real-world environmental challenges. Furthermore, these partnerships could offer additional resources and support for integrating environmental citizenship principles into teacher education curricula, ensuring a holistic and impactful approach to environmental education.

To bolster a sense of responsibility, schools could integrate specific initiatives within teacher education programs, fostering practical engagement in environmental protection. Implementing community clean-up events, tree planting campaigns, or involvement in local environmental projects. Furthermore, the researchers recommend integrating environmental education into practical initiatives that emphasize an action-oriented approach to address environmental concerns effectively. This approach ensures that teachers education students not only acquire theoretical knowledge but also actively contribute to environmental stewardship through meaningful, real-world experiences.

The constraints inherent in this study, including the utilization of a non-random sampling method, underscore the necessity for additional research in diverse educational settings and among various demographic groups. The researchers encourage further research to investigate the impact of action competence on the pro-environmental

behaviors of future educators in their classrooms and communities. Furthermore, future research should explore critical questions concerning the efficacy of pedagogical methods and the enduring impacts of integrating environmental citizenship into teacher training programs on student learning outcomes.Investigating the intricate underlying mechanisms of environmental citizenship could enhance our understanding of how such programs influence attitudes and behaviors.Such research can provide focused insights, shaping effective interventions and programs for a sustainable, environmentally conscious educational landscape.

ACKNOWLEDGEMENTS

The authors express their profound appreciation for the collaborative spirit that has surrounded this research. The realization of this project would not have been possible without the invaluable contributions of those who made this endeavor both rewarding and purposeful.

First and foremost, the authors have a sincere appreciation for the research supervisors whose expert insight and feedback have been instrumental in the enrichment of the quality of the study.

The authors also express appreciation to the University of Mindanao for its steadfast commitment to academic excellence and conducive scholarly environment that has played a significant role in driving this research forward.

Lastly, the authors deeply appreciate the love and unwavering support of their respective families which has been the greatest source of strength and motivation behind the success of this endeavor.

COMPETING INTERESTS

The authors have declared that no competing interests exists

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