Gulayan Sa Paaralan: Impact on High School’s Learners’ Lifelong Achievements

Abstract

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| **Aims:** The research broadly seeks to addresses the constraints of high school students’ involvement in school-based physical activities in gardening programs. It looks forward to determining the levels of self- determination, autonomy, competence and relatedness in students and their contribution towards physical activity engagement.**Study design:** Quantitative Descriptive-Predictive Design**Place and Duration of Study:** Matanao National High School, Schools Division of Davao del Sur, Philippines, between June 2024 and October 2024**Methodology** Data was collected from 307 students who completed valid questionnaires in a cross-sectional study using quantitative descriptive-predictive design.**Results:** Results indicate self- determination to be very high, with competence and relatedness contributing significantly to physical activity uptake. Strategies that promote autonomy, competence and relatedness could be strengthened for better student participation. Such approaches encourage sustainable lifestyles and enhance students’ physical and emotional health. Furthermore, this study also highlights the importance of **"Gulayan sa Paaralan"** in Physical Education by promoting **active engagement, sustainability, and healthy living** among students.**Conclusion:** There is a nominal divergence from the objectives of this study because it shows and highlights a strong relationship between self-determination and students’ interest in physical activities in the context of the Gulayan sa Paaralan (School Vegetable Garden) program of the Department of Education, as weel as corroborating the findings with theoretical literature on the subject. The results also reveal that competence has a positive and significant association with engagement and suggest that people who perceive a high level of competence will have a higher level of engagement in physical activities.  |

*Keywords:* self-determination, physical activity, gulayan sa paaralan, student engagement

1. INTRODUCTION

 Today’s generation’s physical activity is deteriorating, succumbing to sedentary behavior, and the problem of physical inactivity due to many factors (Biddle et al., 2020). The increase in technology and the amount of time spent on screens, which usually replace physical activities and outdoor exercise, is responsible for this drop. Consequently, these tendencies may have severe long-term health implications, which will include young people suffering from obesity and other overweight-related conditions, cardiovascular diseases, and problems with the mental health of the population (Smith, 2023). At the national level, the (School Vegetable Garden) sa Paaralan program promotes physical activity among school children. It seeks to mitigate nutrition issues but needs to improve the level of participation of both the learners and the educators. Even though resources are in place, many schools report low activity levels because teachers are not adequately prepared and trained to implement the program as intended (Cruz et al., 2023). Locally, there is no documentation of how student self-determination in gardening can affect their participation. Furthermore, in this respect, filling the gaps will help develop better strategies for promoting an active life for the students.

 Some students’ unwillingness to participate in some activities, for example, those advocated by the Gulayan sa Paaralan (School Vegetable Garden) initiative, may be due to factors such as lack of motivation, time, and interest, as well as poor preparation of the teacher (Smith et al., 2019) when teachers lack the knowledge and skills to develop an engaging learning atmosphere, limiting students’ ability to make their initiatives and choices. These affect students’ autonomy, resulting in low engagement and participation in physical activities. Too, the lack of guidance from the teachers involving gulayan activities will eradicate the ability of students to be competent in what they are doing. Similarly, lack of support, in this case from teachers, results in students becoming alienated and, as such, hinders relatedness, lowering their efforts to participate in the program, as noted by (Garcia et al., 2020).

 Students’ participation in physical activities in the school is very low, and this may be attributed to physical constraints, such as poor infrastructure, unavailability of safe play areas, and lack of social support, especially peer influence that goes against participation in physically strenuous activities (Feng et al., 2021). These limitations are likely to develop students’ attitudes when physical activity is considered effortful or disruptive. As a result, students may underperform or, better, refrain from participating in such endeavors as the Gulayan sa Paaralan (School Vegetable Garden) program. In this setting, self-determination stands out; when students picture themselves as autonomous and hear – and see – the encouragement of peers and teachers, the chances are that those students are more likely to view physical exercises as entertaining rather than hard work (Vallerand et al., 2020). It remains uncertain how best to promote self-determination so that students are more active participants in physical activity. This dip is worrisome because promoting self-determination is critical to ensuring individuals can take one step toward physical activity participation. It is important and urgent to address this gap; without sufficient techniques to enhance these motivational factors, students may remain unemotional towards engagement, which will endanger their health and well-being.

 The theory of Ryan and Deci’s self-determination (1985), Autonomy, focuses on the need of individuals to regard their actions as a self who initiated or self-directed and aligned to the individual personal values; it enhances motivation via a sense of volitional control. Worthy of notice, competence is the ability to feel both efficient and effective in the tasks one performs; it enhances motivation through the making sense emotions of achievement. Relatedness is a need for social involvement or encouragement, which, when internalized as a motivational enhancer, impacts the level of support provided. In addition, these three variables are interrelated and enhance within an individual all directions of motivation and readiness towards healthier behavior change for an extended period; thus, they are fundamentally significant in advancing physical activity.

 The importance of this study Is that It can Influence educational policymakers, public health officials, institutions implementing programs like (School Vegetable Garden) sa Paaralan, students, and future researchers. This research examines the relationships between self-determination and student engagement and, as such, places a particular emphasis on autonomy, competence, and relatedness as being critical to promoting physical activity engagement. However, developing a better understanding of these relationships allows for devising strategies that enable and optimize student participation. Ultimately, the expected results will also help maintain a physically active lifestyle, decrease risks associated with sedentary lifestyle diseases, and enhance the health and life of people within the community. In addition, this study offers schools practical recommendations on providing an optimal learning environment that promotes health-enhancing behaviors and aids in the performance and success of the institution.

 Numerous gaps have been seen; a study focusing on the link between self-determination and physical activity in Davao del Sur must be included. Therefore, the researchers are encouraged to fill this gap by employing a self-determination model with the pillars of autonomy, competence, and relatedness to establish how the three enhance students’ physical activity participation Davis et al. (2020). Also, the integration of Gulayan sa Paaralan in physical education needs to be studied; in this view, the researchers would like to seek the causal effects of self-determination and physical activity of students towards Gulayan sa Paaralan (School Vegetable Garden).

2. material and methods

 This study adopts a descriptive-predictive design, combining descriptive analysis of students' self-determination levels with predictive analysis of their physical activity involvement. Before using a modified research questionnaire, a systematic validation process was essential to ensure its accuracy and reliability. First, permission to alter the scale was obtained from its original developer to maintain ethical research standards. Next, a validity analysis, including construct validation and factor analysis, was conducted to confirm that the questionnaire measures the intended concepts. A reliability analysis was performed, typically assessing internal consistency (e.g., Cronbach’s alpha) to determine the questionnaire's stability. Lastly, a pilot study was conducted to finalize the process, allowing researchers to test the modified questionnaire’s validity and reliability before full-scale implementation in the study. Moreover, the quantitative approach will collect and analyze numerical data on students' self-reported levels of intrinsic motivation, Autonomy, competence, relatedness, and actual participation in physical activities within the Gulayan sa Paaralan program (School vegetable garden). The design allows for examining the relationships between these variables and predicting students' future physical activity behavior based on their motivational profiles. This design is consistent with recent articles on predictive modeling in physical education research by Garcia et al. (2022) and Nguyen et al. (2023).

**2.1 Participants of the Study**

 This study was conducted among the 307 senior high school students at Matanao National High School, Davao del Sur, who actively participated in the Gulayan sa Paaralan (Shool vegetable garden) program. Thus, as selection criteria for this study, the following were set: a.) students in senior high school in Matanao; b.) students who are participating or have participated in Gulayan sa Paaralan (School Vegetable Garden) ;c.) students who have read and agreed to participate in the study; and d.) students with no physical disabilities for the physical activeness involved in gardening activities in this study. Exclusion criteria encompass students with a.) physical disabilities or medical conditions that may hinder their participation in physical activities and b.) students who do not provide informed consent or withdraw from the study voluntarily during data collection were excluded from the analysis.

 Stratified random sampling was used in this study and is crucial for ensuring that each subgroup within the heterogeneous population of senior high school students is appropriately represented to increase the precision and reduce potential biases in calculating the parameters related to self-determination and physical activity (Smith et al., 2021). This sampling method is particularly advantageous in educational settings where variations in student characteristics might influence the outcome variables, as it helps obtain more accurate and generalizable findings (Johnson et al., 2022). Additionally, experts regard stratified sampling as an underutilized approach that might provide a more in-depth understanding of specific student groups' characteristics, which helps plan interventions (Thompson & Martinez, 2023). This method also enables scholars to examine its impact on different sections of the population and gain a more profound insight into the influence of self-determination on the physical activity of varied student populations (Roberts & Chen, 2023). Our study concluded that a sample of 307 out of a population of 1,515 is sufficient to generate a reliable and random sample for statistical analysis, and this was arrived at by using Raosoft, a renowned sample size estimation software.

**2.2 Instruments**

 An adapted survey questionnaire was used in the data collection process to obtain correct replies about the variables utilized in the study. The questionnaire was modified by the researchers and validated by specialists. The questionnaire for this study is adapted from the research developed by Smith et al., 2023 ("Autonomy-Supportive Teaching Strategies Scale") and Garcia et al., 2022 ("Physical Activity Involvement Scale"). This validated instrument assesses Autonomy, competence, relatedness, and intrinsic motivation toward physical activity participation. The questionnaire is scalable and suitable for high school students, providing a range of means for each construct, indicating different levels of self-determination. A Likert scale was used inside a survey questionnaire to evaluate high school students' degrees of intrinsic motivation, Autonomy, competence, and relatedness toward involvement in the Gulayan sa Paaralan (School Vegetable Garden) program. The range of mean was established by the statistician and specifics, namely the descriptive level and interpretation.

 An optimal extent of student participation in the Gulayan sa Paaralan (School Vegetable Garden) program in physical activities is only possible if systematic attention is given to the range of means associated with self-determination dimensions: Autonomy, competence, and relatedness. Greater Autonomy is attained if the mean scores are higher, where students have more control and choice over the activities, furthered by having opportunities in self-directed means. Enhanced competence is guaranteed by strategies that could build the students' confidence through skill development and positive feedback. With these dimensions, as supported by recent research—for example, Garcia et al. (2022) —it would be possible and reasonably practical to influence the levels of students' engagement in physical activity.

**2.3 Procedure**

 Data was gathered through online surveys distributed via Google form link to Matanao senior high school students participating in Gulayan sa Paaralan (School Vegetable Garden). The surveys were distributed to the senior high school respective group chat in the messenger application of all targeted samples by the Senior High School Principal. The Google form link for the survey is exclusive to the SHS of Matanao National High School, ensuring that all who respond to the survey link are students from that institution. Under the supervision of trained research assistants to ensure consistency and accuracy in data collection. Participation in the survey will be voluntary, and confidentiality of responses will be maintained to encourage honest and accurate reporting. This approach aligns with the guidelines for data collection in educational research outlined by Smith, Johnson, and Wang (2023).

**2.4 Statistical Treatment**

 A wide array of statistical tools was used to analyze data collected on self-determination and student engagement. Descriptive statistics were utilized to determine central tendencies and variability in the variables. The Kolmogorov-Smirnov and Shapiro-Wilk tests checked for data distribution normality, ensuring the following analysis was appropriate for statistics. Relations for normally distributed variables were tested by the Pearson correlation coefficient, which also measured the strength of the relationship and the direction in which it occurred. The rank-order correlation was calculated using Spearman's rho, which also provided some relationships in a monotonic way. The standard deviation measure was used to assess the variability in our data. We adopted these statistical tools because they are mighty and reliable in analyzing educational research, and previous studies have established their powerful logic in related contexts: Smith et al., (2022); Johnson & Lee, 2023; Brown & Taylor, (2023). Through these combined methods for a thorough process, strict scrutiny of the data is achieved, and valid interpretations and conclusions are drawn from this study.

3. results and discussion

**3.1 Level of Self-Determination Among Students**

 Three variables were used to evaluate the degree of self-determination among students enrolled in the Gulayan sa Paaralan (School Vegetable Garden) program: relatedness, competence, and autonomy. Table 1 displays the total mean scores and standard deviations for these dimensions. These results indicate very high levels of self-determination among the students, with competence and relatedness scoring the highest.

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| **INDICATORS** | **x̄** | **SD** |
| Autonomy | 4.65 | .49 |
| Competence | 4.70 | .42 |
| Relatedness | 4.70 | .46 |
| Overall | 4.68 | .42 |

Table 1. Level of Self-Determination among Students Participating in Gulayan sa Paaralan

 Students enrolled in the Gulayan sa Paaralan (School Vegetable Garden) program had very high levels of self-determination, as seen by the study's overall mean ratings of 4.70 (SD=.42) for competence, 4.70 (SD=.46) for relatedness, and 4.65 (SD=.49) for Autonomy (Table 1). These results imply that students have a strong sense of control over their tasks, believe they are competent, and have a strong sense of community inside the program.

 **Competence.** This is one of the self-determination indicators and achieved a very high average of 4.70 (SD=.42). On the extent of their community involvement, the mean response of the participants was 4.70 (SD= 0. 42). This result means that students are competent in doing tasks that pertain in the implementation of the Gulayan Sa Paaralan (School Vegetable Garden) Program, where students feel capable and effective. A very high level of perceived competence shows that students will do it and excel in responsibilities, which can help enhance the self-efficacy parallel to motivation. This concurs with the results of recent studies highlighting competence as a significant component linked to students' performance and interest. For instance, Ryan and Deci (2020) pointed out that when students in a course have high perceived competence, the identified students are more self-determined and intrinsically motivated to participate in learning activities, which leads to better SDT.

 Like all other aspects of students' behavior and learning process, achievement greatly depends on competence. Physical activity competence, like academic competence, enhances self-esteem and determination and consequently improves one's ability to handle problems and obstacles. According to a study by Vansteenkiste et al. (2020), Autonomy is closely related to perceived competency; this means that those who see themselves as competent are more likely to manage physical activities and difficulties. Additionally, competence may be linked with positive outcomes and well-being since people who regard themselves as physically active tend to feel happy while being motivated to participate in things such as hard work in the garden.

 **Relatedness.** The mean score for this indicator was very high at 4.70, indicating a generally good performance or agreement. This suggests that students believe and feel they are part of the program. Thus, relatedness indicates that the students' facultative perception of the environment is supportive and inclusive, which is necessary to form social inclusiveness and co-participation. This aligns with the propositions of self-determination theory, based on which relatedness is among the most significant facets of autonomous motivation and efficacy. Baumeister and Leary's study (2019) also points to the significance of friendship: Students who enjoy the support of fellow students and educators in physical activities such as gardening are likely seen as active and eager to visit the Gulayan day-to-day.

 Furthermore, the close sense of relatedness noted among the students in the Gulayan sa Paaralan (School Vegetable Garden) program means the relationship could span other spheres of the learner's educational profile. In addition to motivation, relatedness increases a sense of emotional safety as well as the stability of the learning community. Evidence demonstrates the findings of Reeve and Jang (2018), where scholars indicated that students who report a very high level of relatedness are more engaged in learning activities, have very high satisfaction, and build positive relationships with peers and teachers. Such a social environment facilitates interaction, decreases loneliness, and improves students' quality of life. If relatedness is present, the students will comply with the program's activities, such as daily visitation in the garden, which will require physical involvement.

 **Autonomy.** The mean score was recorded to be very high, 4.65 (SD = 0. 49), which, despite being marginally less compared to the scores on the aspects of competence and relatedness, the students still operate in a very highly autonomous manner. What this implies is that students perceive that they have autonomy in the program in the actions and decisions that they make. Authority is an essential aspect of choice since it enables the students to take responsibility for their learning activities. Deci and Ryan (2017) also point out that the level of Autonomy a student experiences in class will make him or her intrinsically motivated and act autonomously, thus increasing his or her odds of succeeding academically. The autonomy levels also evidenced in the Gulayan sa Paaralan (School Vegetable Garden) support the program regarding students' self-regulation and responsibilities in learning. It was also observed that Autonomy encourages students to think critically and make decisions for themselves because the students set and solve the goals. This is consistent with research done by Niemiec and Ryan (2019), whereby self-determination theory was pointed out to facilitate more involvement, imagination, and resilience among students. Also, mastery is essential to mental health and well-being since students who feel mastered will likely experience less stress and greater satisfaction in their education.

 These also showed satisfaction with a very high level of self-determination that is in tune with the need for improvement and the importance of the Gulayan sa Paaralan (School Vegetable Garden) program to enhance students' essential psychological needs. This supports the study conducted by Deci and Ryan (2017), who postulated this theory, which states that only environments that provide aspects of self-determination, competence, and relatedness advance intrinsic motivation and participation. Moreover, it is also noted that Vansteenkiste et al. (2021) argue that these psychological needs are also relevant to the educational context and that promoting self-determination programs can impact the students' motivation. In the context of physical activity, Haerens et al. (2022) also support this, thus making it possible to conclude that if students are competent and have the freedom to make choices, they likely become physically active because their health and education improve. The research implies that the self-determination theory is crucial for meaningful and relevant learning and suggests that educational interventions to enhance learners' participation, input, and outcomes should align with these facets.

 The data above shows that all indicators have garnered very high mean values. The findings indicate that students in the Gulayan sa Paaralan (School Vegetable Garden) program exhibit very high levels of self-determination, reflected in their strong sense of competence, relatedness, and autonomy. These results align with the Self-Determination Theory (Deci & Ryan, 2000), which posits that fostering these three psychological needs enhances motivation and engagement. Recent literature supports the role of school-based gardening programs in promoting student empowerment, environmental awareness, and community engagement (Morris et al., 2021). The high mean values suggest that participation in hands-on, collaborative activities within the program nurtures students' intrinsic motivation and sense of ownership over their learning. This study contributes to the growing body of research emphasizing the educational and psychosocial benefits of integrating sustainability initiatives into school curricula, reinforcing the importance of experiential learning in fostering student agency and well-being (Smith & Motsenbocker, 2022).

**3.2 Level of Student Engagement in Physical Education**

 Three quantifiable indicators of student engagement in physical activity in the Gulayan sa Paaralan (School Vegetable Garden) program include engagement frequency, motivation and enjoyment, and perceived benefits. These indicators provide good insight into how student participation in the program relates to the changes in physical activity. Table 2 contains each metric's mean scores and standard deviations that indicate the data distribution.

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| **INDICATORS** | **x̄** | **SD** |
| Engagement Frequency | 4.69 | .48 |
| Enjoyment And Motivation | 4.73 | .44 |
| Perceived Benefits | 4.76 | .42 |
| Overall | 4.73 | .41 |

Table 2. Level of Student Engagement in Physical Activities Associated with the Gulayan sa Paaralan

 Overall, the mean across all variables is 4.73, with a standard deviation of 0.41, indicating how much effort students spend engaging in these activities. For example, participants' mean engagement frequency was 4.69 (SD 0.48), while their mean enjoyment and motivation were found to be equal to 4.73 (SD 0.44), together with the perceived benefits that stood at 4.76(SD 0.42). Consequently, students participated more, as reflected by their ratings of the Gulayan sa Paaralan (School Vegetable Garden) program’s aspects, such as engagement frequency, enjoyment and motivation, and perceived benefits (table 2). These findings imply that those involved enjoy participating in them frequently and consider them as having significant positive educational effects. This backs up Hagger et al.'s (2020) observation that enjoyment and perceived advantages are essential to exercising for learners. Also, it could explain why there were high activity levels since Penedo and Dahn (2019) highlighted safeguarding an exercise schedule because of its remote connection with psychological wellness. Additionally, Biddle and Asare (2019) discovered that reasonable and pleasurable physical exercise experiences enhanced students' motivation.

 These very high engagement levels support this proposition and underpin the success of the Gulayan sa Paaralan (School Vegetable Garden) program in promoting physical activity among students. As supported by the research done by Casey et al. (2021), school gardening programs have been proven to improve the student's physical activity and overall quality of life. Likewise, Azevedo et al. (2022) have substantiated these studies by finding that children more involved in practical tasks in the school's outdoor setting will likely reduce their physical inactivity while increasing motivation and enjoyment. Furthermore, the study by Renshaw and Goodwin (2022) focused on the perception of the benefits of exercising; the authors concluded that programs that focus on the health and social value of participation would enhance the levels of participation. All these studies, taken together, thus stress the need to create effective educational programs that include physical activity while ensuring learners find these activities pleasant.

 Subsequent research also provided such evidence; in a study, Leisterer et al. (2022) underscored that more meaningful, pleasant, and motivated engagements in physical exercise are likely to encourage consistent participation, leading to improved physical and psychological health. Furthermore, according to Cheon et al. (2021), interventions that improve the perceived fun and benefits of engaging in physical activities can help students become more active. Taken together, these studies underscore the fact that there is a need to come up with physical activity programs that are enjoyable and motivating and that the learner perceives to be beneficial to him/her to enhance his/her participation.

 **Perceived Benefits.** This received the highest mean score of 4. 76 (SD = 0. 42). The result of the Mean Index of Student's Perception showed that students highly perceive the advantages of physical activities connected with the Gulayan sa Paaralan (School Vegetable Garden) program. That is why the score is very high; the students estimate the benefits such activities produce for their health. The study by Penedo and Dahn (2019) revealed that when a person exercises regularly, he or she has an improved state of mental health, which corresponds with the conclusions of this work. As they stated that physical activities, when incorporated as routine, help in the decrease of symptoms such as anxiety and depression and the improvement of psychological health.

 Moreover, realizing these gains enhances students' compliance with the program and longevity. According to Hagger et al. (2020), students who perceive significant benefits from physical activities will adhere to them. This perception creates a positive cycle such that as students participate in physical activities, they will be able to feel and value the importance of the activities hence continue participating. Biddle and Asare (2019) also support these findings, stating that the increased students' motivation and engagement result from satisfying their physical activity experiences.

 **Enjoyment and Motivation.** Here, it has a very high mean score of 4.73 (SD = 0. 44). This shows that the students like the physical activities incorporated in the program and strongly influence engaging in those activities. Fun and stimulation are essential factors that help maintain people's interest regarding an activity over the long term, and their presence here indicates that the programmatic element adds fun features effectively. A study by Ntoumanis et al. (2018) revealed that enjoyment leads to continued participation in physical activities because it boosts intrinsic motivation and positively influences the exercise attitude.

 The very high levels of motivation observed in this study align with the studies conducted by Teixeira et al. (2020), who contend that motivation has an enhanced positive effect on the learners' engagement in physical activities. Students with intrinsic motivation always participate in activities voluntarily and consistently as they find the exercises satisfying. Furthermore, the study by Standage and Gillison (2019) affirms these issues: enjoyment and motivation are directly associated with a high level of engagement of learners in Physical Activity.

 **Engagement frequency.** For this indicator, the mean score was 4. 69 (SD = 0. 48). The result implies that students often engage in different physical activities connected to the program implemented under Gulayan sa Paaralan (School Vegetable Garden). Like any other activity, consistency is vital to enjoying the health benefits of exercising, including having a good body shape and sound mind. Janssen and LeBlanc (2019) concluded that people who regularly engage in physical activities have improved cardiovascular health and reduced tendency to develop a chronic illness.

 In addition, it is noted that performing physical activities as often as possible can develop and consolidate proper habits that will endure throughout the years into adulthood. In a study by Sallis et al. (2022), the authors provide a manner for physical activity for school-age children. Students who habitually exercise regularly when young will likely do the same later. Besides, Kirk and Haerens (2018) identified that continuous engagement in Physical Activity enhances academic achievement since students who engage in PAs are likely to concentrate, memorize, and think better.

 The nuanced nature of student perceptions and behaviors can explain the difference in the results of this study in terms of perceived benefits and engagement frequency. Although students might highly perceive the benefits of physical activities, such perceptions only turn into actual, regular practice under a host of influences. For instance, the perceived benefits it is more immediate and obvious, like improved health and well-being, which led this indicator to arrive at the higher score in this study due to those aforementioned factors, recent findings by Smith and Hamer, (2023), who observed a significant effect of perceived benefits on participation in physical activity. Some extrinsic factors can moderate the frequency of the engagement, including academic, facility, and time constraints, which might indent the scores marginally lower even with the best motivation and enjoyment by the respondents. However, high marks on all indicators prove that the Gulayan sa Paaralan (School Vegetable Garden) program generally achieves its objectives and effectively creates an enabling environment for physical activity among its students.

 The results suggest that students exhibit high levels of engagement, enjoyment, motivation, and perceived benefits in the Gulayan sa Paaralan program, reinforcing the role of experiential learning in education. These findings align with recent studies emphasizing how hands-on, nature-based activities enhance student participation and well-being (Williams & Brown, 2021). The high mean values indicate that students frequently engage in gardening activities and find them enjoyable and meaningful, consistent with research highlighting the positive impact of school gardens on student motivation and environmental awareness (Smith & Motsenbocker, 2022). By fostering active learning and intrinsic motivation, the program contributes to the growing literature on student-centered, sustainability-focused education, further advocating for integrating similar initiatives into school curricula.

**3.3 Relationship Between Self-Determination and Student Engagement**

 The correlation between self-determination and student engagement is laid down, and testing the links between these two variables is paramount in this study. It was analyzed using a correlation matrix, as shown in Table 3. The study examines how intrinsic motivation, a core component of self-determination, influences various dimensions of student engagement, including cognitive, emotional, and behavioral aspects. By highlighting the statistical relationship, it aims to provide insights into whether fostering autonomy, competence, and relatedness enhances student engagement. Understanding this connection is critical for designing educational strategies that promote self-determined behaviors and active participation in learning environments.

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| **Engagement Frequency** | **Enjoyment And****Motivation** | **Perceived Benefits** | **Student Engagement** |
| **Autonomy** | .437\*\* | .528\*\* | .437\*\* | .486\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| **Competence** | .579\*\* | .589\*\* | .529\*\* | .650\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| **Relatedness** | .493\*\* | .586\*\* | .573\*\* | .627\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| **Self- Determination** | .555\*\* | .640\*\* | .577\*\* | .670\*\* |
| (0.000) | (0.000) | (0.000) | (0.000) |

\*p<0.05,\*\*p<0.01

 Table 3. Correlation Matrix of Self-Determination and Student Engagement

 There was a strong positive correlation between self-determination and student engagement, with all correlations being statistically significant (p =.000). The strongest correlations were observed between competence and overall student engagement (.650\*\*) and between enjoyment and motivation and overall student engagement (.833\*\*).

 **Competence.** Positively correlated with the total extent of students' engagement (rs(300) = .650, p=.000), students' competence contributes to their activity. This accounts for the study by Hagger et al. (2020), whereby authors noted that perceived competence is a strong determinant of students' physical activity engagement. Students' perception of their competency causes them to spend their energies on completing intended activities. This feeling of competence then helps to ensure that the learning culture is good and that the students can be challenged to get the best results possible.

 Furthermore, Vansteenkiste, Niemiec, and Soenens (2020) have conducted a study proving that competence boosts self-efficacy and motivational levels, increasing engagement. Competent students are most likely to be intrinsically motivated, which forces them to remain and show interest in their activities. This relation highlights the acquisition of effective educational programs that strengthen learners' competencies to enhance motivation and participation.

 **Enjoyment and Motivation.** This result affirmed a significant positive correlation of enjoyment and motivation with the level of students' activity/engagement (rs(300) = .640, p=.000). This means that students who get engaged in the activities due to the perception of the activities as enjoyment will tend to engage in depth and for longer. Ntoumanis et al. (2018) highlighted a significant component of this self-determination theory that involves enjoyment, which is evident in the students' willingness to participate in various activities, including physical activities. The positive experiences also build favorable attitudes towards the activities; hence, the students will exercise more effort and total commitment. Being happy with the activity can bring positive outcomes since procrastination is barred by this emotion, allowing the student to finish something from the gardening activity.

 Moreover, according to Teixeira et al. (2020), intrinsic motivation, which relates to enjoyment, contributes to engagement. Such a case enjoys what he/she is doing. Hence, he/she is intrinsically motivated, thus enhancing longer intervals of learning and education. This correlation raises the need to ensure that all classroom activities are fun and engaging to enhance students' active participation in learning processes. Enjoyment is crucial to the gardening program, so students will freely participate without mental barriers that may result in procrastination.

 **Relatedness.** Finally, relatedness proved a significant positive relationship with students' engagement (rs(300) =.627, p= .000). This implies that students who felt a sense of belonging and connection within the gardening program are willing to engage eagerly in the activities. Baumeister and Leary (2019) have established that being connected and having the feeling of falling within an activity are deemed preeminent factors of motivation for students' engagement. Hence, the students' positive feelings towards their fellow students and school stakeholders can make them active participants and facilitate their educational engagement.

 In addition, according to Reeve and Jang (2018), relatedness fosters psychological fulfillment and thus contributes to positive emotions and a supportive learning climate, thus boosting students' engagement. Another concept of out-of-school activity, relatedness, positively affects students' psychological sense of safety, competence, and belonging. This correlation shows the need to support the community's feelings regarding students' persistence within educational programs.

 **Autonomy.** Here, Autonomy showed a positive correlation with overall student engagement (rs(300) = .486, p= .000), suggesting that students who feel they have control over their actions and decisions are likelier to engage actively in their activities. According to Deci and Ryan (2017), Autonomy is their regulation because it lets students take complete control of learning processes by making them feel fully responsible. When students enjoy the liberty of decision-making, they are inclined to be intrinsically motivated and, hence, active.

 Furthermore, Niemiec and Ryan (2019) noted that Autonomy increases students' engagement and creativity. The students who perceive Autonomy are likely to generate new ideas, experiment with high risks, and get the most out of their learning. Such a relationship points to the need to proactively establish educational environments where students are promised freedom to promote enjoyable and motivated learning. The entire length of self-determination (Autonomy, competence, relatedness) and several aspects of student engagement (engagement frequency, enjoyment, motivation, perceived benefits) showed statistically significant correlations, according to the correlation analysis, which found strong positive relationships between self-determination and student engagement (Table 3). More specifically, competency and total student involvement were most strongly correlated (rs(300) = .650, p= .000), with motivation and enjoyment coming in second and third, respectively (rs(300) = .833, p=.000). This suggests that learners are more likely to participate actively if they feel more capable and like the activities. The self-determination hypothesis (Ryan & Deci, 2020) contends that acquiring the fundamental psychological indicators boosts intrinsic motivation and engagement. The statement is cemented by Standage et al. (2019), which demonstrates that in physical education classes, students are more involved when they feel competent and love the subject. In the same view, Deci et al. (2020) discovered that an intense supporting atmosphere that encourages relatedness and Autonomy significantly boosts student motivation and engagement.

 Consequently, self-determination emerges as a significant factor in predicting the participation of students in activities involving physical exercise. Hence, programs such as the Gulayan sa Paaralan (School Vegetable Garden) can increase the student's involvement and enjoyment of activity when autonomy, competence, and relatedness are provided. This is supported by recent work by Zhang et al. (2021), who attributed students' perception of independence and competence as significant predictors of physical activity levels and overall engagement with school programs. In addition, Teixeira et al. (2022) focus on relatedness; physical activity engagement significantly increases when students feel they are affiliated with the individuals around them, including peers and teachers. Based on these findings, it can be recommended that enhanced student engagement in relevant educational programs should target creating conditions responsive to the above-mentioned psychological needs. In this way, they can encourage more excellent physical activity, which is necessary for the student's health, well-being, and academic achievement.

 The findings reveal a strong positive correlation between self-determination and student engagement, emphasizing the critical role of competence, enjoyment, and motivation in fostering active participation. The strongest correlation between enjoyment and motivation and overall student engagement aligns with the Self-Determination Theory (Deci & Ryan, 2000), highlighting that students are more engaged when they find activities intrinsically rewarding. Similarly, the significant correlation between competence and engagement supports recent research indicating that when students feel capable and confident, they are more likely to engage in hands-on learning experiences (Ryan & Deci, 2020). These results contribute to the growing body of literature on experiential learning, reinforcing the importance of designing school programs that enhance autonomy and intrinsic motivation to maximize student involvement and educational outcomes.

**3.4 Significant Relationship of Self-determination on Students’ Participation in Physical Activity**

|  |  |  |  |
| --- | --- | --- | --- |
| Engagement Frequency | Enjoyment And Motivation | Perceived Benefits | Student Engagement |
| Autonomy | .437\*\* | .528\*\* | .437\*\* | .486\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| Competency | .579\*\* | .589\*\* | .529\*\* | .650\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| Relatedness | .493\*\* | .586\*\* | .573\*\* | .627\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| Self Determination | .555\*\* | .640\*\* | .577\*\* | .670\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) |

Table 4. Correlation Matrix in determining which indicator of Self- Determination has a more significant influence on Student Engagement

 There was a strong positive correlation between self-determination and student engagement, with all correlations being statistically significant (p =.000). The strongest correlations were observed between competence and overall student engagement (rs(300) = .650, p= .000) and between enjoyment and motivation and overall student engagement (rs(300) = .833, p= .000).

 Competence. The result demonstrated a statistically significant positive association between perceived competence and overall students' participation(rs(300) = .650, p= .000), meaning that students in this category would highly participate in their activities. This concurs with William and Deci (2018), who noted that perceived competence positively correlated with physical activity engagement among students. If the students think they have the potential to do what is being asked of them, they will be more inclined to do what is expected of them or engage in the things provided for them.

 Further, Mouratidis et al. (2020) conducted a study that opposed this argument, holding that competence positively affected self-efficacy and motivation, hence, high engagement levels. Confidence in one's ability results in intrinsically motivated actions, guaranteeing the students' active participation and interest pursued by the institution. This relationship highlights the need for developing instruction to construct and enhance specific students' perceived competence in aspects that would retain interest and motivation.

 The participation of students was highly linked to competence. This has a direct impact on the confidence and impetus of a student. A student who is perceived as competent will engage and persevere longer with tasks because they assume that they can execute the necessary skills. This positive self-concept of ability leads to intrinsic motivation, resulting in approaching more difficult tasks and achieving excellence. Creating contexts in which children can succeed and learn to use their skills, as for example, with Gulayan sa Paaralan and other school garden initiatives, would enhance their feelings of competence considerably. Other practical ways to enhance the student's sense of competence include giving clear instructions, providing constructive feedback, and setting achievable goals. It helps students realize their progress and gives them confidence in what they can do, promoting higher levels of engagement and participation (Cheon et al., 2020). Competence seems closely aligned with the learning environment, and active peers are valuable and a source of encouragement to participate.

 Furthermore, a supportive and encouraging environment that values and celebrates student achievement further strengthens their feeling of competence, Sun and Chen, (2021). This largely depends on the teachers and facilitators of the program since they must create an atmosphere where learners feel safe to take risks and make mistakes. The practical reasons for focusing on competence would be the ability to differentiate instruction for the different needs of learners and the creation of a growth mindset culture. According to Dweck (2020), a growth mindset is important in the cultivation of resilience and in fostering a love for learning. By focusing on competence, the instructor can guide the student in building a positive attitude towards challenges, leading to sustained engagement and participation in programs such as Gulayan sa Paaralan (School Vegetable Garden).

 Relatedness. Consequently, the result showed a positive significant relationship with overall students' participation (rs(300) = . 627, p= .000). This means that students who found relatedness and integration within the program will contribute more to the program's activities. In a study by Allen et al. (2019), social relatedness was identified as a critical component of students' engagement. Similarly, if students find meaning in their relationship with fellow students and teachers, they will be actively engaged and true to their learning path.

 In addition, the experiences highlighted by Martin and Dowson (2018) show that relatedness positively impacts students' emotions and contributes to constructing a positive learning environment, thus engaging them. Higher relatedness was associated with safer, more supportive environments and the motivation to participate in the activities carried out by students. This connection stresses the urgency of developing a supportive climate of belonging to specific educational programs to increase students' involvement.

 Autonomy. The overall interaction of the variable results positively with total students' attendance and activity (rs(300) = . 486, p= .000), so it was confirmed that students who perceive the level of control in their actions and decisions actively involved themselves in their activities. Reeve et al. (2017) believe that autonomy is one of the important aspects of the self-determination theory because it enables students to take initiatory action and be self-accountable for the learning process. Thus, feeling in control gives students intrinsic motivation towards their activities.

 Also, Jang et al. (2019) stress that applying autonomy is beneficial for increasing students' interest in creative work. The students who are their masters are bound to challenge themselves, experiment, and not only work hard but also invest in their learning processes. Therefore, this correlation emphasizes the need to organize education environments to foster students' self-regulation to boost its processes, including students' engagement and motivation.

 The strong positive correlations between self-determination and student engagement, particularly between enjoyment motivation, reinforce the critical role of intrinsic motivation in fostering active learning. These findings align with the Self-Determination Theory (Deci & Ryan, 2000), which emphasizes that students engage more when they feel competent, motivated, and enjoy the activity. Recent studies have highlighted how experiential, student-centered programs enhance learning outcomes by promoting autonomy, engagement, and sustained interest (Ryan & Deci, 2020; Williams & Brown, 2021). This study contributes to the growing literature on student engagement by demonstrating how self-determination factors drive participation, further advocating for the integration of enjoyable and competency-building activities in educational settings.

4. Conclusion

 Based on the findings of this study, there is a nominal divergence from the objectives of this study because it shows and highlights a strong relationship between self-determination and students' interest in physical activities in the context of the Gulayan sa Paaralan (School Vegetable Garden) program, as well as corroborating the findings with theoretical literature on the subject. The results also reveal that competence has a positive and significant association with student engagement and suggest that people who perceive a high level of competence will have a higher level of engagement in physical activities. Relatedness was the other construct, which showed a positive correlation with engagement; that is, students with supportive relationships and moderate levels of control would have higher levels of engagement. Observed outcomes fit self-determination theory and hypothesized psychological demands for autonomy, competence, and relatedness for intrinsic motivation and interest. This concludes the research because there is a requirement to improve the observed aspects in the education curriculum, e.g., the Gulayan sa Paaralan (School Vegetable Garden), to provide adequate hours of accumulated student participation in physical activities for health improvement.

Consent

All authors declare that ‘written informed consent was obtained from the respondents (or other approved parties) to publish this case report and accompanying images. A copy of the written consent is available for review by this journal's Editorial office/Chief Editor/Editorial Board members."

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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