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RESEARCH ARTICLE

Honing Students' Intrinsic Motivation and Integrating Technology in Education through Self-Learning Modules

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ABSTRACT

Education has necessitated the adoption of technology-enhanced learning, and self-learning modules have emerged as a flexible and efficient method of education. The researchers aimed to explore the effects of self-learning modules on students' intrinsic motivation and their perceptions of their effectiveness. The study employed descriptive research design, utilizing observational methods, surveys, and interviews to gather data from 35 grade 11 students in a STEM program. The researchers developed e-modules using Kotobee software, covering Earth Science topics. The Intrinsic Motivation Inventory (IMI) was used to assess students' intrinsic motivation. The findings revealed that the use of self-learning modules positively impacted students' intrinsic motivation. Students reported high levels of interest/enjoyment, perceived competence, effort/importance, perceived choice, and value/usefulness. The interactive features of the e-modules, such as videos, simulations, and animations, contributed to students' enjoyment and engagement. Students also expressed a sense of autonomy and control over their learning experience, leading to increased motivation.

INTRODUCTION

The COVID-19 pandemic has forced a significant shift in conventional educational delivery, pushing for the rapid adoption of technology-enhanced learning, including self-learning modules. During the pandemic individuals are taking precautions to reduce physical contact and movement during the COVID-19 pandemic, thereby limiting the spread of infection (Chu et al., 2020; Jarvis et al., 2020; Pepe et al., 2020). Technology in education has played a vital role in ensuring the continuity of learning during these challenging times (Funa et al., 2024). Hence, research has shown a growing interest in the integration of technology in education using self-learning modules.

Ryan and Deci's (200) Self-determination theory (SDT) suggest that intrinsic motivation can be achieved by satisfying three basic psychological needs, namely autonomy, competence, and relatedness. The theory proposes that individuals have an inherent desire to engage in activities that they find interesting and enjoyable, and which fulfill their psychological needs (Ryan & Deci, 2020). When these needs are satisfied, people experience an enhanced sense of well-being and intrinsic motivation (Ryan & Deci, 2000). Studies have confirmed the fundamental principles of SDT, indicating that the satisfaction of psychological needs is positively related to intrinsic motivation in various contexts and activities (Gagné & Deci, 2005; Standage, Duda, & Ntoumanis, 2005). Consequently, SDT underscores the significance of supporting people's innate psychological needs as a strategy for promoting well-being and intrinsic motivation. Self-directed learning and intrinsic motivation can be improved using self-learning modules (Gallagher & Rudge, 2021).

Self-learning modules are viewed as a beneficial method for promoting learning and gaining knowledge without the need for in-person interactions (Yoon & Park, 2017). The use of self-learning modules offers a flexible and efficient way of teaching and learning and can be accessed anytime and

anywhere without the need for physical attendance (Gallagher & Rudge, 2021). This approach allows learners to have the flexibility to learn at their own pace, location, and time, which can be particularly advantageous during times of limitations and unpredictability (Jakaria et al., 2022). Several studies have demonstrated the effectiveness of self-learning modules in promoting self-directed learning and enhancing students' motivation and engagement (Muthuprasad et al., 2021; Yoon & Park, 2017).

Hence, the current researchers conducted the study to augment students' intrinsic motivation by employing a technology-infused self-directed learning module, while investigating their perceptions of such a method. The two primary questions that the researchers aimed to address were: (1) To what extent does the use of self-directed learning modules enhance students' intrinsic motivation? (2) What are the students' perceptions concerning the effectiveness of self-directed learning modules in elevating their intrinsic motivation?

METHODOLOGY

Research design

The researchers utilized a descriptive research design to explore the effects of technology-integrated self-learning module on students' intrinsic motivation. Both observational and survey methods were employed to gather data from the students, with the aim of examining the issue in its current state (Leedy & Ormrod, 2001; Williams, 2007). To validate the students' responses and journal entries, a sequence of interviews was conducted, which is an essential tool for obtaining comprehensive information and drawing significant statistical conclusions (Creswell & Creswell, 2018).

Participants

This study focused on grade 11 students (n = 35) enrolled in the Senior High School Science, Technology, Engineering, and Mathematics (STEM) program, who were officially registered in the Electronic Module Distance Learning (EMDL) class. These students were accustomed to virtual learning environments and had previous experience with technology-based education. It is important to acknowledge that this sample has specific characteristics that may be relevant to this study, but the findings may not necessarily be applicable to other populations outside of this context.

Instruments

The researchers used the E-learning self-directed interactive modules (ESelfIMo) for Earth Science (Lasala, in press) that were created using Kotobee software program in response to the need for interactive, innovative, and self-directed learning materials. These e-modules focused on Earth Science topics for the second semester's first quarter, namely: (1) Earth's Characteristics, (2) Earth's Subsystems, (3) Rocks and Minerals, (4) Energy Resources: Fossil Fuels, (5) Energy Resources: Geothermal and Hydrothermal Power Plant, (6) Earth's Resources: Water Resources and Anthropogenic Activities that affect Water Quality and Availability, (7) Earth's Resources: Soil and Anthropogenic Activities that affect Soil Quality and Availability, and (8) Waste Generation and Management. Master teachers from senior high school (n = 3), Technology evaluators (n = 2), and science content experts from higher education institution (n = 3) were engaged to evaluate the ESelfIMo with respect to its content, instructional quality, and technical features (Lasala, in press).

In addition to the ESelfIMo, as the main instrument, The researchers explored six indicators of intrinsic motivation in this study, and these are as follows: interest/enjoyment, perceived competence, effort/importance, pressure/tension, perceived choice, and value/usefulness with five to eight indicators each rated by the respondents using a seven-point Likert scale-making 7 as the highest possible rate and 1 as the lowest possible rate. Negative items marked with the (R) or reversed symbol were scored backward to help the researchers assess the dependability of students' responses and to avoid "straight line" replies. Rescoring is therefore required in order to fit these items with the positive items; 7 is the lowest and 1 is the highest, wherein 7 was replaced by 1 and 1 was replaced by 7. The negative components might then be considered as normal for better analysis by altering the scores of items with the (R) symbol. It is a multidimensional 45-item 7-point Likert-scale adapted survey questionnaire from earlier studies on intrinsic motivation, which allows the researchers to assess post-experimental intrinsic motivation (McAuley et al., 1989; Ryan et al., 1983; Lasala, 2022). It has been found to have high validity, with the internal consistency of its four subscales rated as follows: $\alpha = .78$ for interest/enjoyment, $\alpha = .80$ for perceived competence, $\alpha = .84$

for effort, and α = .68 for pressure/tension. The overall internal consistency was rated as having a Cronbach's alpha estimate of .85 (McAuley et al., 1989).

In the following tables and discussion, all reversed scores were converted to positive values (Lasala, 2022; Funa et al., 2021; Creswell & Creswell, 2018). In addition, since statistical data does not determine the initial level of motivation of students and may not exclude other factors that may affect students' motivation during the intervention, the study used students' journal entries and informal interviews to support the result of the study. The objective of the study and the components measured in IMI guided the flow of results in the discussion of this study.

Data gathering procedures

To ensure ethical compliance, the researchers sought permission from the Principal of Sorsogon National High School to conduct the study, as well as issued letters to the parents of student participants requesting their consent for their children to take part in the research. The instructional material was comprised of nine validated E-SELFIEMO modules covering various sub-topics of Earth Science. The topics covered were selected from the Earth Science Course lessons outlined in the Most Essential Learning Competencies of the Department of Education for Senior High School. Each week, each student was given a specific E-SELFIEMO module, which was later collected. Afterwards the researchers administered the Intrinsic Motivation Inventory. The eight-week instructional time was allocated to cover all topics as prescribed by the DepEd MELC for each lesson module in the Senior High School Earth Science subject. Furthermore, after each lesson, students were required to write in their journal about their learning experiences, and the researchers conducted informal follow-up interviews to verify the students' responses.

Statistical analysis

The researchers used descriptive statistics to examine the level of intrinsic motivation of students after using the ESelfIMo, which included the weighted mean and standard deviation. The weighted mean was assessed using a range of scales, which included strongly agree (6.6-7.0), agree (5.6-6.5), somewhat agree (4.6-5.5), neutral (3.6-4.5), somewhat disagree (2.6-3.5), disagree (1.6-2.5), and strongly disagree (1.0-1.5). To substantiate the results of the IMI, the researchers also utilized responses from the students' journals and interviews.

RESULTS AND DISCUSSION

The results and discussion were organized systematically according to the research objectives. The first objective was to investigate the effects of self-learning modules on students' intrinsic motivation. The second objective was to explore students' perceptions regarding the effectiveness of self-directed learning modules relevant to their intrinsic motivation.

According to the cognitive theory of learning, motivation is considered a fundamental aspect of cognition and has a direct influence on students' academic performance (Harasim, 2012). Based on this premise, the researchers sought to examine the effects of self-directed learning modules on students' intrinsic motivation in learning. Below presents the comprehensive findings of the Intrinsic Motivation Inventory (IMI) administered to students following the implementation of these modules.

Table 1: Level of intrinsic motivation along interest/enjoyment

Items	Weighted Mean	SD	Interpretation
I enjoyed participating in this lessons very much	6.30	0.65	A
This lessons was fun to do	6.20	0.65	A
I thought this was a boring lessons (R)	6.30	0.65	A
This lessons did not hold my attention at all (R)	6.45	0.55	A
I would describe this lessons as very interesting	6.70	0.40	SA
I thought this lessons was quite enjoyable	6.35	0.75	A
While I was participating in these lessons, I was thinking about how much I enjoyed it.	6.30	0.70	A
Average	6.37	0.62	**A**

Note: (R) – Reversed; SA – Strongly Agree; A – Agree

Table 1 illustrates that the overall weighted mean for interest or enjoyment is 6.37, with a standard deviation of 0.62, indicating an "Agree" interpretation. In terms of intrinsic motivation, this category suggests that students found the lesson enjoyable, fun, interesting, engaging, and attention-worthy. The students expressed agreement that the use of the ESelfIMo facilitated their enjoyment, active participation, attentiveness, and interest in the lesson. An essential feature of interactive e-books or e-modules like the ESelfIMo, developed using Kotobee, is their ability to encourage student participation and offer various elements such as videos, simulations, audio, animations, and more. These features contribute to holding students' attention and making the lesson enjoyable and interesting.

The agreement among students regarding the enjoyment, fun, interest, and engagement of the lessons suggests that the use of interactive e-books or e-modules can be highly effective in fostering a positive learning environment. By incorporating features like videos, simulations, audio, animations, and other interactive elements, the ESelfIMo helps to capture students' attention and maintain their interest throughout the lesson (Lasala, 2022; Funa et al., 2021). This, in turn, can enhance their overall learning experience and potentially improve academic performance. A student's response to these results is shown in Plate 1.

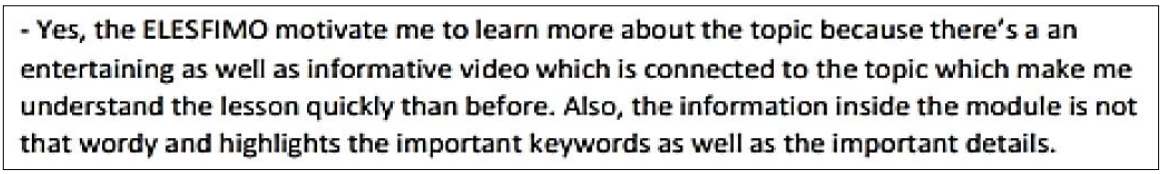

- Yes, the ELESFIMO motivate me to learn more about the topic because there's a an entertaining as well as informative video which is connected to the topic which make me understand the lesson quickly than before. Also, the information inside the module is not that wordy and highlights the important keywords as well as the important details.

Plate 1: Students' journal entries highlighting the effects of the ESelfIMo on their motivation to learn

Plate 1 depicts an example of a student's journal entry response when asked about their motivation to learn using the ESelfIMo on the topic of Earth's characteristics. The student emphasized that one factor contributing to their motivation was ESelfIMo's capacity to present information through videos, which enhanced the learning experience by making it more entertaining rather than purely informative.

In a study conducted by Bidarra, Figueiredo, and Natálio (2015) on the impact of ebooks like Kotobee, similar conclusions were drawn. The study found that learning with ebooks, particularly when combined with mobile devices, is increasingly appealing, especially for high school students. This further supports the potential of utilizing electronic modules such as ESelfIMo, which integrate technology into education and facilitate the delivery of content materials in a more organized manner. By fulfilling the needs of both students and teachers, these electronic modules can enhance the learning experience and promote effective educational practices.

Table 2: Level of intrinsic motivation along perceived competence

Items	Weighted Mean	SD	Interpretation
I think I am pretty good at these lessons.	5.30	0.85	SmA
I think I did pretty well at these lessons, compared to other students.	5.20	0.85	SmA
After working at these lessons for a while, I felt pretty competent.	6.10	0.70	A
I am satisfied with my performance at these lessons.	6.00	0.80	A
I was pretty skilled at these lessons.	5.50	0.90	SmA
This were lessons that I could not do very well (R)	6.00	0.80	A
Average	5.68	0.82	**A**

Note: (R) – Reversed; A – Agree; SmA-Somewhat Agree

In terms of perceived competence in intrinsic motivation, students expressed agreement that the ESelfIMo helped them feel competent, confident, and satisfied with their knowledge, skills, and performance in the lessons. This is evident from the overall weighted mean of 5.68 and a standard deviation of 0.82. These findings indicate that ESelfIMo has the potential to motivate students to learn by empowering them to actively participate, accomplish tasks, and perform well in class. This aspect of intrinsic motivation is closely related to the perceived choice indicator. In this category, students

also agreed that they had the freedom to choose whether to participate in the lesson and the extent to which they would participate. The weighted mean for this indicator was 5.99, with a standard deviation of 0.89. Interactive electronic modules or books like the ESelfIMo often emphasize self-directed learning. With the ESelfIMo, students can progress through the lesson at their own pace, particularly during asynchronous lessons, and review the material at their convenience. Furthermore, they have control over the completion of tasks within the e-modules.

> **ESELFIMO has major benefits for improving self-study and learning skills. It enabled me to participate in understanding the topics offered in the module, which were complemented with superb graphics and features. It strengthens my sense of responsibility by requiring me to do the tasks indicated in it.**

Plate 2. Sample the student's journal entry in response to the question of whether the ESELFIMo motivates him to study independently.

The students' journal entry, as shown in Plate 2, regarding the ESelfIMo further reinforces this assertion, as the student expressed that using ESelfIMo enabled her to enhance her self-study and learning skills, as well as her sense of responsibility. ESelfIMo, functioning as an interactive and self-directed learning module, shifts the primary responsibility for the learning experience and outcomes from teachers to students. While support from teachers and other resources is still necessary, the utilization of ESelfIMo or similar interactive and self-directed e-modules has the potential to increase students' sense of accountability for their learning, thereby granting them greater control over their learning experience.

In a comparable study, Yulianto (2022) arrived at the same conclusion, stating that the use of eBooks is designed to facilitate more independent learning for students, whether at home or in school. By having access to eBooks or e-modules, students are afforded additional time for self-study, encouraging them to become more independent by engaging in student-centered tasks. By incorporating appropriate features within each lesson delivered through e-modules, students' thinking and motivation can be stimulated, motivating them to take initiative in their learning journey.

Table 3: Level of intrinsic motivation along effort/importance

Items	Weighted Mean	SD	Interpretation
I put a lot of effort into this.	5.50	0.50	SmA
I did not try very hard to do well at these lessons (R)	5.20	0.70	SmA
I tried very hard in these lessons.	6.20	0.50	A
It was important to me to do well at these lessons.	6.25	0.50	A
I did not put much energy into this (R)	5.85	0.50	A
Average	5.80	0.54	**A**

Note: (R) – Reversed; A-Agree; SmA – Somewhat Agree

Regarding effort/importance and value/usefulness, students also agreed that the ESelfIMo contributed to their perception that the lessons were beneficial and that they performed well. This observation can be attributed to the concept of learning by doing, which is integral to this study. When students actively engage in tasks themselves, they are more likely to experience a sense of satisfaction with their performance. They gain firsthand knowledge of the effort required to accomplish the task and are more likely to recognize the connection and relevance of what they are learning in their real lives.

> Yes, my exploration of the app encouraged me to learn more about the topic. The information supplied there enhanced my development as a student and as a person. It makes me feel as if I still have a lot of things to learn that I haven't yet discovered.

Plate 3. Students' journal entries regarding their perceived value of using ESELFIMO in their learning experience.

The student's journal entry in Plate 3 further supports the claim that using ESelfIMo in learning provides significant value. The students expressed that through ESelfIMo, they experienced a sense of continuous learning not only as students but also as individuals. This implies that the knowledge acquired through this interactive learning module proved helpful not just within the school context but also in real-life scenarios. As a result, the students felt more motivated to learn. This finding aligns with the results of the study of Huang and Chui's (2015) research, which also discovered that electronic learning resources, such as e-modules and eBooks, cater to the individual needs of learners and assist them in achieving learning objectives efficiently. While this does not suggest that using e-learning materials like ESelfIMo requires less effort from students, it does indicate that locating relevant information becomes more accessible compared to other sources.

Table 4: Level of intrinsic motivation along tension/ pressure

Items	Weighted Mean	SD	Interpretation
I did not feel nervous at all while doing this (R)	3.20	1.40	SmD
I felt very intense while doing this lessons.	3.60	1.00	SmD
I was very relaxed in doing this these (R)	4.00	1.25	N
I was anxious while working on this task.	3.40	1.70	SmD
I felt pressured while doing this lesson.	3.30	1.50	SmD
Average	3.50	1.37	**SmD**

Note: (R) – Reversed; SmD- Somewhat Disagree; N– Neutral

Regarding intrinsic motivation and tension/pressure, students somewhat disagree that the use of ESelfIMo made them feel nervous, anxious, and tense during the lessons. The weighted mean for this indicator is 3.50, with a standard deviation of 1.37. This finding suggests that the use of ESelfIMo actually helps students feel relaxed, calm, and positively excited during the lessons.

This can be attributed to the underlying goal of using ESelfIMo and other e-modules, which is to create a safe space for students to make mistakes and learn from them. As experiential learning is a fundamental concept embedded in ESelfIMo, the interactive and self-directed nature of the e-modules encourages students to explore and discover things on their own, even if it means encountering failures along the way. These failures are considered integral parts of the learning process (Cherry, 2020).

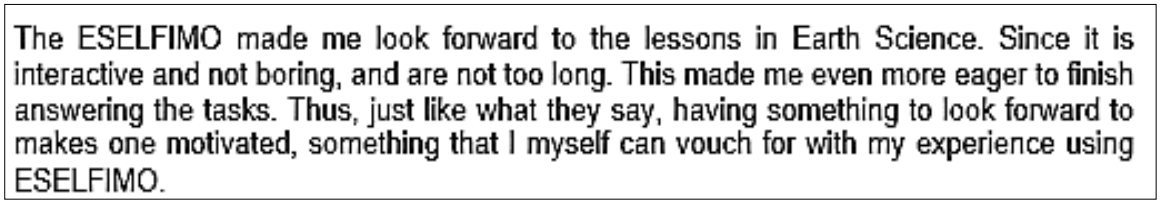

The ESELFIMO made me look forward to the lessons in Earth Science. Since it is interactive and not boring, and are not too long. This made me even more eager to finish answering the tasks. Thus, just like what they say, having something to look forward to makes one motivated, something that I myself can vouch for with my experience using ESELFIMO.

Plate 4. Student's Journal Entry on Perceived Pressure or Tension While Using ESELFIMO.

The student's journal entry in Plate 4 reveals that ESelfIMo generated a sense of excitement about upcoming lessons. Instead of dreading the learning experience, the use of interactive e-modules offers students something to anticipate due to the numerous possibilities and options available within these modules. Bonk et al. (2017) also found that the use of self-directed and interactive modules enables students to express their creativity without the fear of rejection or shame, as they can engage with the materials at their convenience and according to their preferences. This increased control over their learning process empowers students, leading to greater engagement and confidence rather than feelings of anxiety and uncertainty.

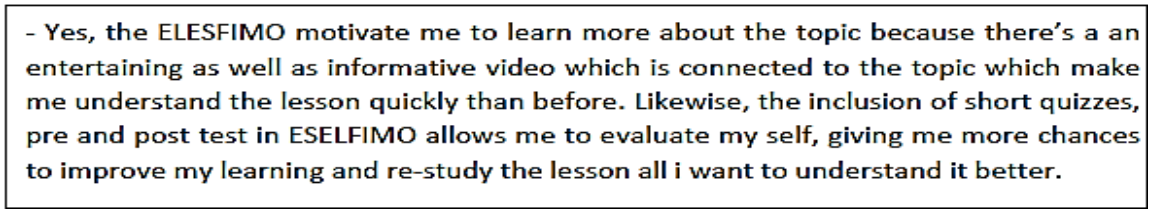
Table 5: Level of intrinsic motivation along perceived choice

Items	Weighted Mean	SD	Interpretation
I believed I had some choice about participating in these lessons.	6.00	1.00	A
I felt like it was not my own choice in participating into this lessons (R)	5.65	1.00	A

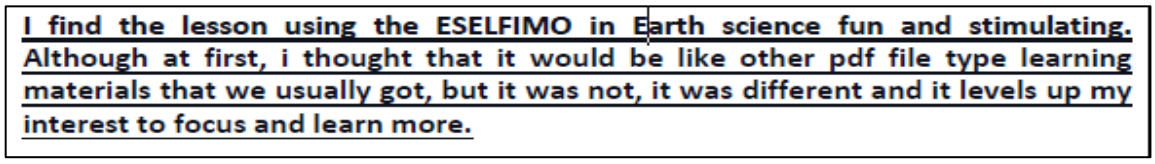
I didn't really have a choice in participating into this lessons (R)	6.00	0.95	A
I felt like I had to participate into this lessons (R)	6.00	0.80	A
I participated in these lessons because I had no choice (R)	6.20	0.70	A
I participated in these lessons because I wanted to.	6.55	0.75	A
I participated in these lessons because I had to (R)	5.55	1.00	A
Average	5.99	0.89	**A**

Note: (R) – Reversed; SA – Strongly Agree; A – Agree; SmA- Somewhat Agree

Table 5 presents the level of intrinsic motivation based on the perceived choice of learning earth science concepts in a self-directed learning module. The weighted mean scores indicate that students reported a relatively high level of intrinsic motivation, with an average score of 5.99 and a standard deviation of 0.89, indicating an "Agree" interpretation. Notably, students reported feeling that they had some choice about participating in the lessons, and this perception may positively contribute to their motivation, as evidenced by the highest score of 6.55 for the item "I participated in these lessons because I wanted to."



Student #1



Student #2

Plate 5. Students' Journal Entry on Perceived Choice While Using ESELFIMO.

The students' journal entries on plate 5 reveal that ESELFIMO impacts their motivation and learning experiences. By offering an interactive and enjoyable approach to learning, ESELFIMO may enhance students' intrinsic motivation by providing them with a sense of choice and autonomy over their learning process. The presence of entertaining videos and self-assessment opportunities within ESELFIMO stimulates their interest and understanding of the material. These findings emphasize the importance of creating learner-centered environments that encourage autonomy and personal engagement, ultimately leading to improved motivation and better learning outcomes. This aligns with the various studies that posit that individuals are more motivated when they feel a sense of autonomy and volition in their actions (Toland, 2023; Guay, 2022; Chiu, 2022; Deci & Ryan, 1985). When students feel that their interests and preferences drive their participation, they are more likely to be engaged and enthusiastic about their learning, resulting in better educational outcomes. This further implies that incorporating similar features and strategies in educational materials and platforms can enhance students' motivation and their overall educational experiences.

Table 6: Level of intrinsic motivation along with value/ usefulness

Items	Weighted Mean	SD	Interpretation
I believe this lesson could be of some value to me.	6.50	0.75	A
I think that participating in these lessons is useful.	6.50	0.55	A
I think this is important to do.	6.70	0.60	SA
I would be willing to do this again because it has some value to me.	6.40	0.65	A
I think participating in these lessons could help me.	6.50	0.75	A
I believe participating in these lessons could be beneficial to me.	6.30	0.65	A
I think this is an important lesson.	6.60	0.70	SA

Average	6.50	0.66	**A**

Note: (R) – Reversed; SA – Strongly Agree; A – Agree

Regarding intrinsic motivation and value/usefulness, students agree with the usefulness and potential benefits of using ESELFIMO in promoting effective learning and understanding of the importance of the lessons, with a weighted mean of 6.50 and a standard deviation of o.66. This suggests that the use of ESelfIMo may help the students see the value and relevance of their lessons, thus more likely to be intrinsically motivated and engaged.

Likewise, this may be attributed to the fact that the topics discussed in ESelfIMo include ways to take good care of the earth, which were presented in an interactive and engaging way; this nature of the e-modules encourages students to explore and discover things on their own.

Overall, I found using the ESELFIMO to be an easy and user-friendly experience. It is fun to use as they are interactive and designed in a way that can make learning more entertaining and motivating for students. I did have to mostly do my own research in making the designated output (Terraforming Mars), but the module provided me with some important information and I was able to use it as a guide in understanding and appreciating the lesson.

Student #5

In this lesson, I learned how a geothermal and hydropower plant works, the basic parts of it and how it benefits us as well as our surroundings. Indeed the great minds have stepped onto the bigger picture on how we can conserve our nonrenewable resources and make use of our renewable resources as an alternative for this. And with ESELFIMO, the lesson become more fun and interesting. Complex topics were divided into subparts making it easier to understand. Overall, the experience with the ESELFIMO learning process is better than my setup with the regular modules.

Student #7

Plate 5. Students' Journal Entry on Value/ Usefulness While Using ESELFIMO.

The students' journal entries in Plate 6 further support the claim that ESelfIMo may provide significant value and usefulness in learning science concepts. Both entries emphasize that the module (ESelfIMo) made learning more engaging and comprehensible. Its interactive and user-friendly features make learning entertaining and motivating. These underscore the positive impact of ESELFIMO on student engagement, comprehension, and motivation in learning science concepts. Recent research also claims that digital learning modules such as ESelfIMo may enhance student motivation (Khamparia & Pandey, 2018; Dron & Anderson, 2014; Hattie, 2009), understand scientific concepts, improve students' learning experiences, foster a deeper understanding of complex topics, and promote enthusiasm for the subject (Loyens et al., 2008; Schraw et al., 2006).

Table 7: Summary of the effect of ESELFIMO on motivation in Learning (n = 35).

Components of Intrinsic Motivation Inventory (IMI)	***Mean (Sd)***		**Interpretation**
A. Interest/Enjoyment	6.37	(0.62)	Agree
B. Perceived Competence	5.68	(0.82)	Agree
C. Effort/Importance	5.80	(0.54)	Agree
D. Pressure/Tension	3.50	(1.37)	Somewhat Disagree
E. Perceived Choice	5.99	(0.89)	Agree
F. Value/Usefulness	6.50	(0.66)	Agree
Overall	**5.64**	**0.82**	**Agree**

Table 7 presents the comprehensive findings of the Intrinsic Motivation Inventory (IMI) administered to students following the implementation of these modules. Overall, in terms of intrinsic motivation in learning, the students exhibited a positive response, as evidenced by the overall weighted mean of 5.64 and a standard deviation of 0.82. This indicates that students generally agreed that ESelfIMo played a significant role in enhancing their motivation to learn. One key

advantage of using ESelfIMo is that it grants students greater control over the direction, pace, and style of their learning experience. The inclusion of various interactive widgets and functions in these electronic interactive and self-directed learning modules adds to the engagement and motivation felt by students. These features create an interactive and dynamic learning environment that encourages active participation and fosters intrinsic motivation.

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it can be concluded that the use of technology-infused self-learning modules, specifically the E-learning self-directed interactive modules (ESelfIMo), has a positive impact on students' intrinsic motivation in learning. The results showed that students perceived the modules as enjoyable, engaging, and interesting, indicating a high level of intrinsic motivation. The use of interactive elements, such as videos, simulations, and animations, contributed to capturing students' attention and enhancing their learning experience.

Moreover, students reported feeling competent and satisfied with their knowledge and skills after using the self-learning modules. The modules provided students with a sense of choice and autonomy in their learning process, allowing them to progress at their own pace and take control of their learning experience. This autonomy and perceived choice further motivated students to study independently and take responsibility for their learning.

The findings also revealed that students recognized the effort and importance of the lessons delivered through the self-learning modules. They perceived the modules as valuable and relevant to their real lives, which contributed to their motivation and performance. The experiential and hands-on nature of learning through the modules allowed students to gain firsthand knowledge and a deeper understanding of the subject matter.

Based on the findings of this study, it is recommended that educators and policymakers embrace the integration of technology-enhanced self-learning modules to enhance students' intrinsic motivation and promote effective educational practices. The use of interactive e-modules like the ESelfIMo can create an enjoyable and engaging learning environment, allowing students to learn at their own pace and explore topics of interest. By incorporating features such as videos, simulations, audios, and animations, these modules capture students' attention and enhance their sense of competence and choice in their learning journey. Furthermore, the self-directed nature of these modules fosters independent learning and empowers students to take responsibility for their education. By implementing technology-infused self-learning modules, educators can optimize students' motivation, engagement, and overall learning outcomes.

Limitations Of The Study

Several limitations should be acknowledged in this study. Firstly, the research was conducted in a single educational institution, which limits the generalizability of the findings to other settings. A broader sample size from diverse educational contexts would provide a more comprehensive understanding of the impact of technology-enhanced self-learning modules. Secondly, the study relied on self-reported measures of intrinsic motivation and learning outcomes, which may be subject to response biases or social desirability effects. Objective measures or multiple sources of data could strengthen the validity of the results. Additionally, the study focused primarily on the short-term effects of technology integration, and a longitudinal investigation would be valuable to assess the sustainability and long-term impact of self-learning modules on student motivation and academic performance. Finally, while the study demonstrated positive effects on intrinsic motivation, it did not explore potential negative consequences or challenges that may arise from the use of technology in education. Future research should consider the potential drawbacks and address any ethical or practical concerns associated with technology integration in learning environments.

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