

Exploring Learner Autonomy and Self-Regulated Learning in Open-Distance Education: Impacts on Engagement, Performance, and Instructional Strategies

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Abstract

This study investigates the role of learner autonomy and self-regulated learning in shaping engagement and academic performance within open-distance education, using the International Nuclear Science and Technology Academy Executive Programme at Open University Malaysia as a case study. While open and blended learning models offer flexibility and learner control, they also introduce challenges related to inconsistent engagement and under developed self-regulated learning skills, particularly in elective courses. The research addresses three core questions: (i) how learner autonomy influences early engagement and performance; (ii) how the timing and consistency of engagement impact self-regulated learning practices; and (iii) the effectiveness of current instructional strategies in promoting early engagement and self-regulated learning. A quantitative, cross-sectional analysis was conducted using data from the programme's Learning Management System, encompassing learner engagement logs, performance records, and course completion data. Findings reveal a strong positive correlation between early engagement and successful academic outcomes, with learners who engaged earlier demonstrating higher pass rates and lower instances of zero scores. This engagement pattern served as a reliable proxy for self-regulated learning behaviours such as time management and proactive learning. The results also indicate that existing instructional strategies play a vital role in fostering early engagement, though further refinement—such as structured scaffolding, timely feedback, and progress monitoring—is recommended to support self-regulated learning development more effectively. This study concludes that strategic instructional design, paired with technology-enhanced learning environments, is critical to enabling learners to navigate autonomy successfully. These insights have practical implications for improving engagement, retention, and learning outcomes in open-distance education.

Keywords: instructional strategies, learner autonomy, learner engagement, open-distance education, self-regulated learning (SRL)

1. Introduction

The advent of digital technologies has profoundly transformed educational practices, ushering in a new era of open-distance education characterised by both challenges and opportunities for learner autonomy.

Open University Malaysia (OUM) has been at the forefront of this transformation, actively implementing online, blended, and flexible learning strategies to cater to the evolving needs of learners. According to Fotiadou et al. (2017), learner autonomy is a crucial factor in enhancing the learning process in distance learning environments. This study explores these educational models within the context of the International Nuclear Science and Technology Academy (INSTA) Executive Programme for Educators, focusing on how these models enhance or challenge learner autonomy.

At the core of OUM's approach is a commitment to providing flexible education pathways through well-designed online courses that utilize a robust Learning Management System (LMS). This system supports a diverse mix of text, audio-visual materials, and web-based resources, catering to various learning preferences and enhancing student engagement and autonomy by allowing learners to control the pace and timing of their learning experience. This approach aligns with findings from Cortés (2020), who argues that flexible learning environments not only promote student autonomy and active learning but also enable learners to interact with educational material at their own pace—an essential factor for ensuring continuity, particularly in remote learning contexts such as those experienced during the COVID-19 pandemic.

Additionally, the pedagogical strategies employed at OUM, such as self-learning modules, peer learning activities, and continuous teacher support via interactive tools, are vital in creating an engaging learning environment that supports both independent and collaborative learning experiences. Cordie et al. (2019), in their meta-analysis emphasised that the format of instruction and the quality of content, including teacher interaction, are crucial to driving student satisfaction and learning outcomes in blended environments. These elements underscore the effectiveness of OUM's approach, aligning with best practices that foster deep and meaningful engagement among learners.

The programme incorporates various assessment methods that are crucial for measuring learning outcomes and providing learners with feedback on their progress. Moreover, this introduction clarifies the definitions and applications of 'online' and 'blended learning' models within the context of OUM's educational practices. The specific application of these models in the INSTA program is critically analysed to illustrate their impact on fostering learner autonomy within the unique constraints and freedoms presented by open-distance education.

1.1. Impact of Learner Autonomy in Open-Distance Education

Building on the foundational shifts highlighted in the introduction, the shift towards open-distance education has been transformative, reshaping educational practices to prioritise learner autonomy. This evolution requires students to assume significant responsibility for their learning, introducing challenges and opportunities for enhancing engagement, performance, and self-regulation.

- i. **Enhancing Instructional Design to Foster Autonomy**
Instructional design in open and distance education has evolved to promote learner autonomy, moving away from traditional, structured classroom interactions to flexible, learner-centred approaches. This necessitates designing courses that enable independent learning while providing robust support through digital tools, accessible content, and interactive activities, as noted by Cárcamo and Perez (2022).
- ii. **Increasing Accessibility and Flexibility for Learners**
Open-distance education enhances accessibility and flexibility, especially for non-traditional learners such as working professionals and caregivers. This model allows learners to access educational materials, participate in activities, and complete assessments from any location, thus empowering them to balance their educational commitments with personal obligations (Paningrahi et al, 2021).
- iii. **Leveraging Digital Tools to Enhance Autonomy**
The integration of digital tools, such as LMS, asynchronous discussion forums, and synchronous video conferencing tools, is pivotal in open-distance learning environments. These tools support various learning preferences and enable self-paced, independent study, which is central to fostering learner autonomy.

- iv. **Addressing Challenges to Support Autonomy and Maintain Academic Integrity**
Promoting learner autonomy in open and distance education presents specific challenges, particularly in assessment and maintaining academic integrity. Institutions must implement robust measures, such as plagiarism detection tools and proctoring software, to maintain academic standards and prevent dishonesty in largely unsupervised settings.

1.2. OUM's Expertise in Open and Distance Learning (ODL) and Fostering Learner Autonomy in the INSTA Executive Programme

Open University Malaysia (OUM) is renowned for its pioneering role in Open and Distance Learning (ODL). Leveraging extensive expertise, OUM designs flexible, learner-centred educational programs that empower students to take ownership of their learning. This commitment to ODL ensures accessibility for diverse learners, integrating cutting-edge technologies and self-regulated learning strategies. Such approaches enable learners to balance their personal and professional commitments while fostering lifelong learning and autonomy.

OUM's innovative approach to ODL is reflected in its adoption of online learning platforms, blended learning models, and flexible study options. This strategic implementation enables OUM to combine self-managed learning with face-to-face tutorials and collaborative online tools, allowing learners to navigate autonomy challenges within a supportive environment. This adaptability ensures that OUM remains at the forefront of the evolving educational landscape, promoting global collaboration and cross-border knowledge sharing.

The INSTA Executive Programme for Educators, developed in collaboration with the International Atomic Energy Agency (IAEA), exemplifies this expertise. Designed to empower professionals with the skills to apply nuclear technology safely and effectively, the programme aligns with OUM's mission of fostering autonomous, competent learners equipped to excel in complex, real-world scenarios.

The INSTA Programme includes practical applications, technical workshops, and collaborative research opportunities, equipping participants to uphold the highest safety standards in sectors such as energy, medicine, and environmental management. It encourages self-regulated learning practices and provides access to a robust online platform, supporting learners in emerging economies to adopt nuclear technology for peaceful purposes.

Through the innovative use of open distance learning (ODL), OUM has made the INSTA Programme accessible to a global audience, promoting learner autonomy, collaboration, and skill development. This initiative demonstrates OUM's ability to adapt to the evolving needs of modern learners, positioning it as a leader in open and distance education. The success of the INSTA Programme underscores how OUM integrates technology, flexibility, and learner autonomy to deliver high-quality, impactful education in a dynamic global context.

Specific tools and strategies used in the INSTA programme include:

- **Interactive Platforms:** Utilizing WordPress as the primary content management system, the programme provides a user-friendly interface that enables interactive learning experiences. This platform supports the delivery of creative content and facilitates easy navigation and accessibility, enhancing learner engagement and autonomy.
- **Collaborative Tools:** Online forums, real-time chats, and video conferencing tools are integrated to foster peer interaction and collaborative learning, essential for developing critical thinking and problem-solving skills.
- **Self-Assessment and Reflective Journals:** These tools enable learners to reflect on their learning processes and outcomes, promoting self-regulation and deeper learning engagement.
- **Data-Assisted Learning Design:** By utilising analytics and feedback mechanisms, the programme adapts learning content and strategies to meet the individual needs of learners, further enhancing their autonomy and engagement.

The pedagogical approach in the INSTA programme is supported by a range of literature indicating the effectiveness of these tools in promoting learner autonomy. For example, the integration of technology in learning environments has been shown to enhance engagement and autonomy significantly (Melliti & Henchiri, 2024). Additionally, the use of self-assessment tools aligns with research by Mohammed and Hussein (2023), which demonstrates that allowing learners to assess their progress can lead to increased self-efficacy and autonomy.

By implementing these evidence-based strategies and continuously refining its pedagogical approaches, OUM addresses the unique challenges of fostering autonomy in an open and distance learning environment, ensuring that its educational practices are rigorously aligned with the latest research. This preparation enables educators within the INSTA programme to thrive in complex, real-world scenarios, demonstrating OUM's commitment to excellence and innovation in higher education.

1.3. Problem Statement

Adopting online learning platforms, such as the INSTA Executive Programme by Open University Malaysia (OUM), is reshaping the educational landscape by meeting the growing demand for flexible, accessible, and self-directed learning opportunities in higher education. These platforms enable institutions to offer online and blended learning models that promise significant benefits, including convenience, wider reach, and environments conducive to learner autonomy and self-regulated learning (SRL) (Broadbent & Poon, 2015).

While these platforms are expected to enhance learner engagement and academic performance, particularly in compulsory modules where foundational knowledge is critical, their success relies heavily on learners' ability to take ownership of their education. SRL strategies are crucial in these contexts, enabling learners to effectively manage assessments and assignments and achieve positive outcomes (Zimmerman, 2008).

However, many learners struggle to maintain engagement and performance within these online learning environments. Despite the potential benefits of flexible and self-paced learning, SRL skills are often underdeveloped in learners, resulting in challenges in sustaining motivation and focus. Without adequate instructional support, learners may struggle to apply SRL practices effectively, particularly in elective courses where engagement and guidance are often less structured (Broadbent & Poon, 2015; Zimmerman, 2008).

These challenges highlight the necessity for effective strategies to develop SRL skills and sustain learner engagement in online and blended learning environments. Failure to address these issues can lead to disengagement, suboptimal academic outcomes, and missed opportunities to realise the full potential of online education. This is especially concerning in elective courses, where the lack of support can widen the performance gap between learners who can self-regulate and those who cannot.

The critical issue is understanding how online and blended learning models, such as the INSTA Programme, impact learner engagement, performance, and the development of self-regulated learning (SRL) skills. Addressing this gap is crucial for enhancing instructional strategies, promoting learner autonomy, and ensuring the long-term success of learners in open and distance education.

1.4. Research Objectives

The research objectives are three-fold, as mentioned below:

- i. To examine how learner autonomy influences early engagement patterns and academic performance in open-distance education. To analyse the relationship between the timing and consistency of learner engagement and the development of self-regulated learning (SRL) skills.
- ii. To evaluate the effectiveness of current instructional strategies in supporting early engagement and fostering self-regulated learning in open-distance education.

1.5. Research Questions

The research questions are three-fold, as stated in the following:

- i. How does learner autonomy influence early engagement patterns and academic performance in open-distance education?
- ii. What is the relationship between the timing and consistency of learner engagement and the development of self-regulated learning (SRL) skills?
- iii. To what extent do current instructional strategies in open-distance education support early engagement and foster self-regulated learning practices?

These research questions are designed to systematically address the complexities of online learning as identified in the INSTA Executive Programme for Educators and the broader shifts in educational practices. By investigating these areas, the research aims to provide actionable insights that can help educators and institutions better support their learners in navigating the challenges of online education, thereby improving overall educational outcomes.

2. Literature Review

The shift to online and blended learning models has significantly impacted educational practices, creating opportunities and challenges for educators and learners. With ongoing technological advancements, adapting instructional strategies has become increasingly essential to address the diverse needs of today's learners. This literature review examines various aspects of online and blended learning, emphasising their impact on learner engagement, self-regulated learning practices, and the effectiveness of instructional strategies within the INSTA Programme. By synthesising contemporary research, this section aims to thoroughly understand the complexities and transformative potential of these educational approaches. The review examines the evolution of online and blended learning, the significance of assessment and academic integrity, the influence of learner feedback on instructional design, and the integration of technology into education. Through this analysis, the literature review provides valuable insights to inform future educational practices and improve learner outcomes in digital learning environments.

2.1. Evolution of Online and Blended Learning

The evolution of online and blended learning models is central to understanding the challenges and opportunities of learner autonomy in open-distance education. Fotiadou et al. (2017) assert that learner autonomy significantly influences engagement and success in distance learning. This is complemented by Octaberlina and Muslimin's (2021) research, which connects learner autonomy with positive attitudes toward online learning among students. Both studies underline the pivotal role of learner autonomy in enhancing the effectiveness of learning within open and blended environments, aligning with the study's focus on autonomy as a critical factor in open-distance education's success.

2.2. Technology-Enhanced Learning and Learner Autonomy

The impact of technology on learner autonomy is a recurring theme in recent literature. Fujii (2024) and Carcamo and Perez (2022) both highlight how digital tools facilitate personalized and autonomous learning experiences. Fujii's exploration of flexible, technology-supported environments resonates with this study's emphasis on how technological advancements can be harnessed to support self-directed learning in open-distance settings, addressing the study's aim to explore innovative pedagogical strategies that promote learner autonomy.

2.3. Academic Integrity and Assessment Challenges

The integration of advanced technologies in online learning also introduces significant challenges related to academic integrity, a critical concern for open-distance education. Wu (2024) explores instructional strategies based on Self-Determination Theory to enhance integrity and engagement, providing insights into maintaining academic standards in asynchronous online discussions. This discussion is vital as it

addresses the reviewer's concern about the evolving challenges in online education, including those introduced by generative AI technologies.

2.4. Instructional Strategies and Learning Outcomes

Investigating the effectiveness of instructional strategies in promoting autonomy, Wong et al. (2019) provide evidence that blended learning pedagogies improve autonomy and academic outcomes. These findings are crucial for this study as they offer practical insights into how blended learning strategies can be optimized to enhance learner autonomy in open-distance education, directly linking to the study's focus on instructional strategies that foster autonomous learning environments.

2.5. Theoretical Perspectives on Distance Learning

The theoretical frameworks provided by Achuthan et al. (2024) on Transactional Distance Theory offer a deeper understanding of the dynamics between learners and educators in distance learning. This perspective is essential for framing the challenges and opportunities discussed in the literature, providing a theoretical backdrop that supports the study's exploration of how these dynamics influence learner autonomy and engagement in open-distance environments.

3. Methodology

This study adopted a quantitative research design, complemented by descriptive and exploratory elements, to assess the impact of the INSTA Executive Programme for Educators' online and blended learning models. The primary focus areas included learner engagement, self-regulated learning practices, learner performance, and the perceived effectiveness of instructional strategies.

A descriptive cross-sectional approach was employed to capture a snapshot of learner behaviour and outcomes within a defined timeframe. This approach was selected to allow for a comprehensive analysis of learning data and participant perceptions during a specific programme cycle, thereby enhancing internal validity through consistency in programme design and delivery.

Data collection utilised multiple data sources to ensure triangulation and enhance validity. These included:

- Learning Management System (LMS) analytics: Capturing learner engagement (e.g., logins, resource views, discussion activity), time-on-task, and course completion rates.
- Learner performance records: Including assessment grades, feedback scores, and progression reports across elective modules.

The study adopted a census sampling approach, including all learners enrolled in the elective courses of the INSTA Programme during the specified academic term. This total sampling method enhanced the external validity of the results by ensuring comprehensive coverage and avoiding selection bias. Participant anonymity was preserved throughout the analysis.

Quantitative data were analysed using descriptive statistical techniques (mean, standard deviation, frequencies) and basic inferential methods (e.g., correlation analysis) to explore relationships among key variables. Patterns of engagement and performance were mapped to instructional strategies and learner characteristics to identify any significant trends.

The final phase involved integrated analysis and interpretation of survey and LMS data to develop actionable insights. This convergence of multiple data streams contributed to analytic validity, allowing conclusions to be drawn with greater confidence. Insights from the analysis informed specific recommendations aimed at improving the instructional design, learner support, and engagement strategies within the INSTA Programme's future iterations.

While this study offers valuable insights into the impact of online and blended learning models within the INSTA Executive Programme, several limitations should be acknowledged to contextualize the findings.

- Sample Size and Scope

The study employed a census sampling approach, involving all learners enrolled in the programme's elective modules during the specified term. Given the specialized and small-scale nature of the INSTA Executive Programme, the total number of participants was limited. Although this restricts the ability to generalize findings to broader populations, the use of full population sampling enhances internal validity and ensures that the results are representative of the target learner cohort.

- **Limited Generalisability**

The findings are context-specific and may not directly apply to traditional higher education or large-scale e-learning programmes. The INSTA Programme serves a niche audience of professionals, and the conditions under which they engage in learning—such as prior experience, motivation levels, and institutional support—may differ significantly from those of other learner populations. As such, generalisations should be made cautiously and primarily to similar executive or professional development settings.

- **Cross-sectional Design**

The research adopted a cross-sectional methodology, capturing data at a single point in time. This limits the ability to observe long-term trends, changes in learner behaviour, or the sustained impact of instructional strategies over multiple cohorts.

- **Self-reported Data**

Although the study incorporated objective analytics from the LMS, it also relied on self-reported survey data, which may be influenced by social desirability bias or inaccurate recall. Steps were taken to mitigate this limitation, including the use of validated survey instruments and anonymous data collection.

- **Depth of Qualitative Insights**

While the study benefitted from multi-source data (e.g., LMS, performance metrics, surveys), it did not incorporate in-depth qualitative interviews or focus groups, which could have provided richer, more nuanced insights into learner perceptions and motivations.

4. Findings and Discussion

4.1. Finding

The INSTA Programme requires learners to complete three compulsory foundational courses before enrolling in elective courses: (i) Educator Paradigm for Life-Long Learning, which emphasises continuous personal and professional development; (ii) Pedagogical Approaches, which covers various teaching methodologies to engage learners effectively; and (iii) Learning and Facilitation, which focuses on practical strategies for creating supportive learning environments. After completing these foundational courses, learners select two elective courses from five options, enabling specialisation in areas tailored to their interests and career aspirations. This structure ensures a solid foundational education and the flexibility to explore professional goals.

Table 1 presents the distribution of learner outcomes across the five elective courses, indicating the number and percentage of learners who made progress and received a 0 score. The demographic distribution across five elective courses within the INSTA Programme is (i) Learning Assessment, (ii) Learning Design, (iii) Learning Theories, (iv) Creative Content, and (v) Internet Revolution Learning—revealing varying learner progress and completion levels. In the Learning Assessment course, 4 learners (26.67%) were still in progress, 11 learners (73.33%) had successfully passed, and two learners (13.33%) received a score of 0 out of a total of 15 participants. For the Learning Design course, out of 12 participants, 4 learners (33.33%) were still in progress, 8 learners (66.67%) passed, and no learners (0.00%) received a score of 0.

The Learning Theories course, with 8 participants, showed that four learners (50.00%) were still in progress, four learners (50.00%) passed, and 2 learners (25.00%) received a score of 0. In the Creative Content course, 10 learners (38.46%) were still in progress, 16 learners (61.54%) passed, and 5 learners (19.23%) received a score of 0, out of a total of 26 participants. Finally, in the Internet Revolution Learning course, seven learners (38.89%) were still in progress, 11 learners (61.11%) passed, and 5 learners (27.78%) received a score of 0 out of 18 participants. These results reflect diverse learner outcomes across the courses, with passing rates ranging from 50.00% to 73.33% and zero scores varying from 0.00% to 27.78%.

Table 1. Demographic Distribution Across Five Elective Courses

Course	Total Participants (N)	In Progress (n, %)	Passed (n, %)	0 Score (n, %)
Learning Assessment	15	4 (26.67%)	11 (73.33%)	2 (13.33%)
Learning Design	12	4 (33.33%)	8 (66.67%)	0 (0.00%)
Learning Theories	8	4 (50.00%)	4 (50.00%)	2 (25.00%)
Creative Content	26	10 (38.46%)	16 (61.54%)	5 (19.23%)
Internet Revolution Learning	18	7 (38.89%)	11 (61.11%)	5 (27.78%)

The diverse learner outcomes observed across the five elective courses, with varying pass rates and percentages of learners still in progress or receiving zero scores, prompted a deeper analysis of factors influencing these results—specifically, the impact of the timing of learner engagement on student performance within the INSTA Programme.

Table 2 indicates the Impact of Start Time on Progress, In Progress, and 0 Score on Engagement. An analysis of the provided data indicates that the timing of learner engagement has a significant influence on student performance in elective courses within the INSTA Programme, addressing Research Question 2. Students who began engaging with course materials early demonstrated higher pass rates and average scores than those who started later.

For instance, in the Learning Assessment elective, 73.33% (n=11) of students who passed initiated their engagement between May 30, 2024, and June 23, 2024, achieving an average score of 1. Conversely, students marked as ‘In Progress’ or who received zero scores typically started engaging later, with start times ranging from July 9, 2024, to August 10, 2024, and displayed lower average scores. This trend was consistent across all elective courses analysed.

Early engagement has a direct impact on successful course completion and higher academic performance, suggesting that timely engagement is crucial to effective self-regulated learning practices. These findings underscore the significance of instructional strategies that foster early engagement and promote the development of self-regulated learning skills among students. Such strategies are essential for improving learner performance in online and blended learning environments, aligning with Research Question 3 regarding the effectiveness of current instructional approaches within the INSTA Programme.

Table 2. The Impact of Start Time on Progress, In Progress, and 0 Score on Engagement

Course	In Progress (N)	In Progress (%)	In Progress Start Time	In Progress Average	Passed (N)	Passed (%)	Passed Start Time	Passed Average	0 Score (N)	0 Score (%)	0 Score Start Time	0 Score Average
Learning Assessment (Elective)	4	26.67	2024-08-10 06:06:11, 2024-07-18 18:17:13, 2024-07-18 17:31:51,	0.6071, 0.8929, 0, 0	11	73.33	2024-06-07 15:32:03, 2024-05-30 14:42:35, 2024-07-03 22:16:18,	1, 1, 1, 1, 1, 1, 1, 1	2	13.33	2024-07-18 17:31:51, 2024-07-09 10:10:31	0, 0

			2024-07-09 10:10:31				2024-06-08 03:10:21, 2024-06-05 05:08:23, 2024-06-11 17:20:57, 2024-06-05 01:54:40, 2024-06-15 16:52:55, 2024-06-20 16:11:56, 2024-05-30 00:57:25, 2024-06-23 16:40:53					
Learning Design (Elective)	4	33.33	2024-07-10 10:59:10, 2024-08-10 06:06:12, 2024-07-12 18:08:50, 2024-07-09 10:12:44	0.2222, 0.037, 0.4444, 0.1111	8	66.67	2024-07-21 19:31:49, 2024-06-05 15:18:10, 2024-07-29 14:35:45, 2024-06-15 14:05:27, 2024-06-03 05:35:23, 2024-06-07 14:53:19, 2024-06-07 21:56:05, 2024-06-09 14:51:42	1, 1, 1, 1, 1, 1, 1, 1	0	0.0		
Learning Theories (Elective)	4	50.0	2024-08-10 06:06:14, 2024-07-18 18:18:50, 2024-06-07 14:53:19, 2024-06-29 21:28:18	0.0357, 0, 0.9643, 0	4	50.0	2024-07-04 16:09:31, 2024-05-13 13:04:10, 2024-05-30 08:55:14, 2024-06-29 05:22:54	1, 1, 1, 1	2	25.0	2024-07-18 18:18:50, 2024-06-29 21:28:18	0, 0
Creative Content (Elective)	10	38.46	2024-05-05 17:14:29, 2024-07-02 01:22:21, 2024-06-07 13:11:12, 2024-06-07 13:32:42, 2024-06-07 16:15:23, 2024-08-10 06:06:15, 2024-06-29 21:26:28, 2024-07-17 09:21:12, 2024-07-08 12:10:52, 2024-07-14 13:48:26	0.4074, 0.2593, 0, 0, 0.8519, 0, 0.3333, 0, 0.8519, 0	16	61.54	2024-05-18 23:40:21, 2024-07-01 13:39:21, 2024-07-11 07:33:21, 2024-06-26 12:12:15, 2024-07-20 16:59:53, 2024-06-14 13:22:56, 2024-05-20 15:48:18, 2024-06-03 18:33:04, 2024-06-05 01:54:40, 2024-06-04 14:46:57, 2024-06-07 13:32:44, 2024-07-06 03:54:21, 2024-06-20	1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	5	19.23	2024-06-07 13:11:12, 2024-06-07 13:32:42, 2024-08-10 06:06:15, 2024-07-17 09:21:12, 2024-07-14 13:48:26	0, 0, 0, 0, 0

							16:10:56, 2024-06-29 05:15:48, 2024-05-24 17:01:40, 2024-06-24 14:50:39					
Internet Revolution Learning (Elective)	7	38.89	2024-07-02 01:22:23, 2024-06-07 13:09:56, 2024-06-07 13:34:15, 2024-06-07 16:16:57, 2024-07-06 03:27:10, 2024-07-08 14:49:23, 2024-08-01 15:41:20	0, 0, 0, 0, 0.9524, 0.4762, 0	11	61.11	2024-05-15 19:16:42, 2024-07-10 06:27:09, 2024-06-08 03:05:14, 2024-07-02 17:55:14, 2024-06-03 18:21:31, 2024-07-04 12:45:42, 2024-06-07 13:32:44, 2024-07-01 03:16:39, 2024-06-17 17:41:18, 2024-07-01 16:09:23, 2024-07-01 22:36:46	1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	5	27.78	2024-07-02 01:22:23, 2024-06-07 13:09:56, 2024-06-07 13:34:15, 2024-06-07 16:16:57, 2024-08-01 15:41:20	0, 0, 0, 0, 0

4.1.1. The Influence of Learner Autonomy on Engagement Patterns and Academic Performance

The findings related to the impact of course start times on learner progress, completion, and the incidence of 0 scores are directly aligned with this study's research objectives (RO) and research questions (RQ). Specifically, the data demonstrates that learners who engaged earlier in their courses exhibited higher levels of progress and completion while showing a lower incidence of 0 scores, which directly supports Research Objective 1 (RO1) and Research Question 1 (RQ1).

The data reveals that learners who started their courses earlier demonstrated higher engagement levels, as evidenced by their higher completion rates and lower incidence of 0 scores.

The findings related to the impact of course start times on learner progress, completion, and the incidence of zero scores align directly with this study's research objectives (RO) and research questions (RQ). Specifically, the data demonstrates that learners who engaged earlier in their courses exhibited higher levels of progress and completion while showing a lower incidence of zero scores, thereby supporting Research Objective 1 (RO1) and Research Question 1 (RQ1).

Learners who began their courses earlier demonstrated higher engagement levels, evidenced by increased completion rates and reduced incidence of zero scores (see evidence). For example, the Learning Design course analysis indicates a pass rate of 66.67% (n=8 out of 12 learners). The passing learners commenced at earlier times (such as June 3, June 5, June 7, etc.) with a consistent start time score of 1, illustrating early and total engagement. Conversely, the non-passing learners had lower start time scores (0.2222, 0.037, 0.4444, 0.1111) and began their courses later, corroborating the assertion that delayed engagement correlates with poorer performance.

For instance, in the Learning Design course, all learners who passed (66.67%, n=8) started earlier and consistently achieved a start time score of 1.000, indicating full engagement. Conversely, learners who started later were more likely to still be in progress or to receive a zero score, as seen in the Internet Revolution Learning course, where 27.78% (n=5) of learners who received a zero score had later start times. This suggests that the timing of engagement within the online and blended learning models

significantly influences learner outcomes, directly supporting RO1 and answering RQ1 by highlighting the importance of early engagement in these models.

These findings suggest that the transition to online and blended learning within the INSTA Programme affects learner engagement in compulsory modules. Early start times significantly enhance learner engagement and subsequent success.

4.1.2. The Role of Timing and Consistency in Learner Engagement for Developing Self-Regulated Learning

Additionally, the findings align with Research Objective 2 (RO2) and Research Question 2 (RQ2), which aim to evaluate the timing of learner engagement as a key aspect of self-regulated learning and its impact on performance in online and blended learning environments. The data strongly indicates that early course engagement, as a proxy for self-regulated learning, is associated with better performance. For instance, 61.54% (n=16) of learners who passed had earlier start times in the Creative Content course, with a consistent average score of 1.00. In contrast, learners who started later, reflected by lower start time scores (e.g., 0.2593 or 0.3333), were likelier to progress still or receive a zero score. This pattern highlights the crucial role of self-regulation in academic success, supporting RO2 and RQ2 by showing that learners who manage their time effectively and engage early with course materials tend to perform better.

Early course start times, a proxy for effective self-regulated learning, were consistently associated with better performance outcomes. Learners who started earlier were likelier to pass and had fewer zero scores, highlighting the importance of self-regulation in academic success. This timing of learner engagement reinforces the idea that self-regulated learning practices, such as timely engagement with course materials, are crucial for learner performance in assessments and assignments within the INSTA Executive Programme.

4.1.3. Evaluating the Effectiveness of Instructional Strategies in Fostering Early Engagement and SRL

Furthermore, the findings provide insights into the effectiveness of current instructional strategies, directly supporting Research Objective 3 (RO3) and Research Question 3 (RQ3). The data suggests that instructional strategies that promote early engagement effectively foster learner engagement and self-regulated learning. Courses where learners were encouraged to start early showed higher completion rates and lower instances of 0 scores, indicating that these strategies successfully improve learner outcomes. This suggests that instructional strategies within the INSTA Executive Programme could be further enhanced by emphasising early engagement and supporting self-regulated learning from the outset of each course.

In conclusion, the analysis of start times underscores the significant impact of early engagement on learner progress, completion, and the reduction of 0 scores. These findings are well-aligned with the study's research objectives and questions, demonstrating that the timing of course engagement is a critical factor in learner success within the INSTA Executive Programme. Emphasising early engagement and reinforcing self-regulated learning practices within instructional strategies offer a clear path to improving learner outcomes in online and blended learning environments.

4.2. Discussion

The findings of this study provide significant insights into the interplay between start time, learner engagement, self-regulated learning, and instructional strategies within the INSTA Programme's online and blended learning models. These results closely align with the research objectives and questions, providing a comprehensive understanding of how these factors collectively impact learner success.

- i. Learner Autonomy on Engagement Patterns (Research Objective 1 and Research Question 1)

The study confirms that early engagement is a critical determinant of learner performance in online and blended learning environments. Consistent with findings by Anderson and Dron (2011), the data demonstrate that learners who initiate their participation early experience higher engagement levels, better completion rates, and fewer instances of zero scores. For example, in courses such as *Learning Design*, learners who started their coursework promptly achieved significantly higher completion rates, highlighting the importance of early participation in navigating the demands of these learning models.

Conversely, learners who delayed their engagement encountered challenges such as incomplete coursework and lower overall performance, evidenced by a higher prevalence of zero scores in courses like Internet Revolution Learning. These findings align with the research of Garrison and Kanuka (2004), who emphasised that early engagement is a cornerstone of learner success, particularly in blended learning contexts. Prompt interaction with course materials and activities establishes a foundation for sustained academic achievement, underscoring the importance of prioritizing strategies that encourage early learner involvement.

ii. Timing of Engagement and Consistency in Learner Engagement towards Self-Regulated Learning (Research Objective 2 and Research Question 2)

The timing of learner engagement emerged as a critical aspect of self-regulated learning, significantly influencing academic performance. Hrastinski (2019) highlights the centrality of self-regulated learning in fostering positive educational outcomes, emphasising that learners who effectively manage their time and begin engaging with course materials early are more likely to succeed.

The findings from courses such as *Creative Content* underscore this connection: Learners who managed their time well and started their coursework consistently outperformed those who delayed their engagement. These results suggest that early engagement, as an indicator of self-regulation, is a key predictor of success in online and blended learning environments. Learners who exercise self-regulation by initiating their studies early demonstrate a more remarkable ability to complete assignments, perform well on assessments, and ultimately achieve higher course completion rates. In contrast, late starters often struggled with lower performance levels and higher rates of incomplete coursework, reinforcing the importance of fostering self-regulated learning habits from the outset.

iii. Instructional Strategies in Fostering Early Engagement and Self-Regulated Learning (Research Objective 3 and Research Question 3)

The study also illuminates the effectiveness of existing instructional strategies in promoting early engagement and better learning outcomes. Courses like Learning Assessment exemplify the positive impact of these strategies, with data showing that learners who engaged early achieved higher completion rates and fewer zero scores. This finding suggests that the current instructional design effectively encourages early participation, which, in turn, enhances learner performance.

However, the study also identifies opportunities for improvement. While existing strategies are beneficial, incorporating more structured support mechanisms could enhance their impact. For instance, leveraging techniques such as scaffolding, personalised feedback, and progress monitoring can help learners develop more vigorous self-regulated learning habits early in their coursework (Panadero, 2017). These improvements could reduce the number of learners who face challenges completing their coursework or achieving passing grades.

The findings of this study underscore the crucial importance of promoting early engagement, fostering self-regulated learning, and refining instructional strategies to support learner success. Early engagement emerges as a vital factor, with its timing closely linked to better learner outcomes. Self-regulated learning practices, particularly those involving time management and proactive engagement, play a pivotal role in shaping academic performance.

The study also emphasises the need for continuous enhancement of instructional strategies to provide learners with the tools and support necessary for navigating the demands of online and blended learning models. By prioritising early engagement and self-regulation, the INSTA Programme can optimise its educational approaches, ultimately leading to higher learner satisfaction, improved completion rates, and enhanced academic achievement. These insights serve as a foundation for future research and practical innovations in instructional design and delivery.

5. Conclusion

The findings of this study emphasise the critical role of early engagement and self-regulated learning in ensuring learners' success within the INSTA Programme's online and blended learning environments. The data reveal a clear correlation: more likely to achieve higher completion rates and exhibit fewer zero scores across various courses. These findings strongly align with the research objectives and questions, reaffirming that fostering early engagement and self-regulated learning is central to improving learner outcomes. Furthermore, the study highlights the effectiveness of the current instructional strategies in promoting learner engagement. These strategies, designed to encourage early interaction with learning resources, have shown considerable impact. However, the findings also highlight opportunities for improvement. By introducing more structured and proactive guidance, the programme can better nurture self-regulated learning practices from the outset of each course. For instance, providing learners with personalised progress tracking tools, precise milestone settings, and scaffolding techniques could further empower them to manage their learning more effectively. In addition to improving self-regulation, such enhancements could address common challenges learners face in online and blended settings, such as procrastination and difficulty maintaining motivation. Structured guidance early in the learning journey would help learners develop strong habits and strategies, ensuring they remain engaged and persist through to course completion. In summary, the study highlights that the timing of learner engagement and the development of self-regulated learning practices are crucial to academic success. To optimise learning outcomes in the INSTA Programme, targeted instructional support prioritising these elements is essential. By investing in strategies that actively foster early engagement and equip learners with the tools and skills for effective self-regulation, the programme can enhance its impact and better prepare learners for the demands of 21st-century education.

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