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Instructional design and its contribution to the effectiveness of self-directed learning

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ABSTRACT
In a dynamic global context, self-directed learning emerges as an essential competency, requiring lifelong skills such as self-management, autonomy, responsibility, and self-discipline. This chapter discusses the interaction between self-directed learning and instructional design, emphasizing the pivotal role of the latter in effectively facilitating the self-directed process. The discussion is grounded in a comprehensive literature review, providing a theoretical overview based on contributions from renowned authors in the field. We address examples of educational institutions, highlighting successful practices of self-directed learning supported by instructional design, with a focus on the experience of the Open University of Brazil (UAB). Additionally, this chapter reflects on the methods employed by these institutions to optimize self-directed learning, showcasing the effective integration of instructional design into the curriculum structure. It is concluded that instructional design serves as a significant strategic partner in promoting self-directed learning, outlining guidelines for the selection of suitable educational resources and fostering student autonomy and self-management. Thus, this chapter contributes to a broad understanding of the synergy between self-directed learning and instructional design, offering valuable insights for professionals, researchers, and educators committed to promoting educational excellence at advanced levels of instruction.

Keywords: Instructional design, Self-directed learning, Autonomy, Self-management.

1 INTRODUCTION

The educational environment has recently undergone substantial transformations, driven in large part by the spread of new technologies and the growing demand for flexible and accessible

educational modalities. In this dynamic scenario, self-directed learning has proven to be an effective strategy, empowering students to take control of their own learning processes. However, successful implementation of this approach requires careful instructional design planning to ensure effectiveness in students' self-directed learning journey.

Self-directed learning, as outlined by Towle and Cottrell (1996), is a process in which the student plays an active role in his or her learning, setting goals and objectives, selecting and evaluating resources, and determining his or her own pace of study. This approach emphasizes the learner's responsibility and autonomy in the educational process, promoting the simultaneous development of self-management and self-discipline skills (Ganda; Boruchovitch, 2018). From this perspective, the learner is recognized as the central agent of his or her own teaching-learning experience, assuming full responsibility for all the steps involved in this process (Towle; Cottrell, 1996).

Self-directed learning, perceived as a skill that can be developed throughout life, stands out as an effective learning modality, allowing students to adapt their learning process to their individual needs (Campos, 2022; Schlochauer, 2012). This paradigm highlights the inherent flexibility of self-directed learning, highlighting its potential for personalization of the educational process.

On the other hand, instructional design as defined by Sanches *et al.* (2018), is a strategic process of planning and developing didactic materials aimed at facilitating teaching and learning. This process aims to ensure the effectiveness, efficiency and attractiveness of the materials, optimizing the achievement of the learning objectives by the student. In the specific context of self-directed learning, instructional design plays a key role in bringing the self-directed process to fruition.

In the context of self-directed learning, instructional design, according to Moore and Kearsley (2012), can positively influence self-directed learning by assisting in the selection of appropriate pedagogical resources and by creating an environment conducive to the development of students' autonomy and self-management. In addition, instructional design's ability to establish clear and achievable goals for students, as highlighted by Andrade and Santos (2020), enables learners to clearly understand expectations, effectively monitoring their own progress on the self-directed pathway.

Thus, this chapter proposes to explore the intersection between self-directed learning and instructional design, highlighting the theoretical and practical contributions of these components in the contemporary educational context.

2 CONTRIBUTION OF INSTRUCTIONAL DESIGN TO SELF-DIRECTED LEARNING

Instructional Design (ID), when properly configured, is a component of paramount importance in the optimization of self-directed learning, playing a crucial role in providing guidance and support during the teaching-learning process. According to the approaches of Mendes (2022), Macedo and Bergmann (2018) and Driscoll (2005), the need for instructional design to be designed with student

orientation is highlighted, aligning with their learning journey, and providing them with a clear structure for the effective conduction of the learning process.

A relevant strategy employed by instructional design in promoting self-directed learning lies in the creation of personalized learning environments. According to Kearsley and Shneiderman (1998), such environments allow learners to access learning content that is intricately tailored to their individual needs and interests. In addition to personalization, these environments have the ability to provide personalized *feedback*, constituting an effective tool for learners to monitor their progress and adjust their learning trajectory according to their specific goals and needs.

It is noteworthy that the creation of personalized learning environments, as suggested by Kearsley and Shneiderman (1998), represents a significant advance in the integration of instructional design with self-directed learning. This approach not only addresses the diversity of learners' demands and preferences, but also fosters deeper engagement and active participation, aligning with the fundamental principle of learner autonomy in the educational process.

Feedback plays a relevant role in the context of self-directed learning, as it enables the student to evaluate their own progress and make adjustments in their learning process. Nicol and Macfarlane-Dick (2006) highlight the importance of this element by emphasizing that *feedback* not only serves as an indicator of student achievement but also plays a crucial role in identifying areas for improvement, as well as identifying resources that can effectively contribute to educational development.

In this context, the full understanding and application of *feedback* in self-directed learning, as addressed by Nicol and Macfarlane-Dick (2006), contributes significantly to the student's self-development, by providing valuable insights for continuous improvement and personalized guidance, thus strengthening the learner's autonomy and self-management in the educational process.

The primary strategy employed by instructional design to support self-directed learning is the incorporation of educational technologies. As discussed by Souza *et al.* (2023), these technologies offer a wide variety of features and activities that make it possible for students to access autonomously, with the advantage of customization to meet their individual needs. In addition, educational technologies play an important role in providing immediate *feedback*, enabling learners to monitor their own performance.

In this context, the Virtual Learning Environment (VLE) stands out as a crucial piece, whose design must be meticulously planned to provide effective *feedback* to students about their progress and performance, as advocated by Obilor (2019). The VLE, by offering *feedback mechanisms*, not only stimulates reflection on the learning process on the part of students, but also instigates them to identify specific areas that require improvement. It is worth noting that adaptive systems, as described by Barbosa and Beserra (2015), have the ability to provide *feedback* in an automated manner, adjusting the complexity and content of instruction based on the student's individual performance.

As proposed by Mucundanyl (2021), assessment should be strategically planned to reflect the learning objectives set by the learner, allowing them to demonstrate their knowledge and skills in a meaningful and self-directed manner. The diversification of assessment strategies, such as self-assessment activities, individual or group projects, and the use of digital portfolios, enables learners to document their own progress and learning, providing a holistic and personalised approach to assessment in self-directed learning (Mucundanyl, 2021).

Thus, the integration of educational technologies, the effective design of the VLE and the careful formulation of assessment strategies converging with the principles of self-directed learning highlight the complexity and scope of the role played by instructional design in the contemporary educational context.

The University of Phoenix, located in the United States, represents an educational paradigm that prominently incorporates self-directed learning with the support of instructional design, evidencing an innovative approach in the distance learning scenario. Specializing in offering an extensive range of online undergraduate and graduate degrees, the institution embraces self-directed learning as one of its core principles, providing students with the opportunity to set their own goals, select appropriate resources, and set the pace of individual study (Molina, 2007).

The educational philosophy of the University of Phoenix promotes student autonomy by instigating them to take control of their learning process. This approach is made possible through flexible and personalized instructional design, as highlighted by Molina (2007). This personalization is evidenced by the use of multimedia and interactive resources, which are essential to allow students to navigate their educational paths according to their preferences and own pace.

The use of technological resources plays an important role in the implementation of this educational approach at the University of Phoenix. Information Technology (IT) tools, such as online learning platforms, discussion forums, and video conferencing, are key elements in delivering an engaging and personalized learning experience. These technologies enable synchronous and asynchronous interactions, providing students with access to teaching materials and support resources at any time and place, aligning with the principles of educational flexibility and convenience (Molina, 2007).

The technological approach adopted by the University of Phoenix aims to enhance the effectiveness and efficiency of the learning process. The emphasis on flexibility seeks to meet the diversity of student profiles and contexts, making education more accessible and convenient. According to Molina (2007), the institution emerges as a representative example of how the synergistic integration between self-directed learning and instructional design can transform educational dynamics, providing a more adaptable and inclusive educational experience within the scope of distance learning.

The University of British Columbia (UBC), situated in Canada, is recognized worldwide for its innovative approach to teaching and learning. Recognized for its comprehensive offering of undergraduate and graduate courses and programs, both face-to-face and online, UBC embodies self-directed learning as a core principle, giving students an active role in their own education. Under the tutelage of instructional design, UBC establishes a framework that empowers students to set individual goals, select pertinent resources, and move forward at their own pace, thereby fostering an educational experience tailored to individual needs (Lima Jr., 2018).

UBC's strategy to promote self-directed learning comprises several instructional design initiatives, among which the adoption of Open Educational Resources (OER) stands out. OER, teaching materials freely available on the internet, represent an innovative approach in enabling universal access to high-quality educational resources. UBC, recognizing the potential of OER, maintains an extensive online library that spans a variety of disciplines. It can be seen, therefore, that the integration of technology is evident in the virtual learning environment (VLE), as it provides students with the ability to access educational materials, interact with peers and teachers, and perform online assignments and assessments (Conrad; Openo, 2019).

Project-based learning represents another strategy adopted by UBC to promote self-directed learning. In this approach, students are challenged to apply the knowledge gained in the disciplines to projects relevant to their lives and careers. This practice not only encourages the practical application of the concepts learned but also nurtures students' autonomy and self-discipline throughout the learning process.

In summary, UBC stands out as an example of how instructional design can be skillfully employed to promote self-directed learning. The diversity of strategies adopted by UBC creates a learning environment that not only encourages autonomy and responsibility but also develops essential life and career skills for students. In this context, the university positions itself as a benchmark in the successful integration of advanced pedagogical principles and educational technologies to optimize the educational experience of students.

The University of Porto (UP), located in Portugal, stands out for actively adopting the approach of self-directed learning in its courses, notably evidenced in the Master's Program in Adult Education and Training (MEFA). The main objective of this program is to develop students' capacity for self-managed learning, based on the conviction that adult learners have the intrinsic ability to take responsibility for their own learning process. In this context, the role of the educator in PU is conceived as providing essential guidance and support for students' self-directed journey (Portugal, 2016).

The structure of MEFA at UP is designed based on pedagogical principles that foster critical reflection, problem analysis, and the development of self-management and self-discipline skills. This pedagogical approach aims to cultivate not only the assimilation of knowledge, but also intellectual

autonomy and the capacity for self-regulation in learning. The emphasis is on the creation of an educational environment that fosters the active construction of knowledge by students, thus aligning with the paradigm of self-directed learning (Portugal, 2016).

In order to effectively promote self-managed learning, UP adopts several innovative practices. Undertaking research projects is an outstanding strategy, providing students with the opportunity to apply the concepts learned in practical and challenging contexts. In addition, the institution actively encourages students' participation in academic events, such as conferences and workshops, to further enrich their educational experience and promote the exchange of knowledge.

In addition, UP invests in offering student support services to strengthen self-managed learning. Personalized tutorials and academic guidance are made available to assist students in their learning process, consolidating the institution's mission to be an active facilitator in the development of students' self-directed capacities.

In this way, the University of Porto stands out as an emblematic example of how self-directed learning can be successfully implemented in higher academic programs. By integrating theory and practice, promoting students' active participation in academic research and events, and offering personalized support, UP demonstrates a robust commitment to excellence in education and the development of self-directed skills in its students.

The University of Central Florida (UCF), in the United States, stands out for integrating the approach of self-directed learning into its undergraduate courses, notably evidenced in the Interdisciplinary Individual Studies (IDS) course. This program offers students the unique opportunity to design their own study plan, aligning it with their interests and professional goals. Although UCF provides guidance and support, it is paramount to emphasize that the responsibility for the learning process rests entirely with the student (UCF, 2019).

Parallel to the University of Porto (UP), UCF adopts pedagogical practices that foster self-managed learning among its students. Faculty at UCF are encouraged to employ teaching approaches that promote autonomy, such as the use of research projects, group discussions, individual assignments, and hands-on activities. These strategies aim to create learning environments that encourage student self-regulation, promoting active and reflective participation in the educational process.

UCF, similarly to UP, recognizes the importance of providing student support to strengthen self-directed learning. The university offers a range of resources, including tutoring services, career guidance, and academic counseling. These services are designed to complement the student's role as an active agent in their educational process, offering strategic support to enhance their self-directed skills.

In summary, both UP and UCF converge in incorporating the self-directed learning approach into their courses and degree programs. Both institutions stand out for encouraging students'

responsibility and autonomy in their own learning process, while providing guidance and support for their educational trajectories. This convergence reveals the global relevance and growing acceptance of self-directed learning as a vital component in the contemporary landscape of higher education.

The Lemann Foundation stands out as an exemplary institution in promoting self-directed learning, implementing innovative strategies and a hybrid educational model that incorporates advanced technologies. The institution has adopted a model that combines face-to-face classes with the prominent use of learning technologies, notably the LEARN platform. This platform not only provides content in various formats, but also provides an interactive environment, facilitating communication between students and teachers (Lemann, 2020).

The Lemann Foundation's hybrid model represents a contemporary approach that capitalizes on the synergy between face-to-face instruction and the strategic use of technological resources. The LEARN platform, by offering content in a variety of formats, not only meets diverse learning preferences, but also encourages student autonomy by allowing them to choose the most appropriate format for their learning style.

In addition, the Lemann Foundation adopts a student-centered pedagogical approach, reinforcing the active participation of students in their own learning process. This approach not only emphasizes the importance of student autonomy but also promotes the development of self-directed skills, which are essential for addressing contemporary educational challenges.

In the field of self-directed learning, the Lemann Foundation stands out not only for its commitment to educational innovation, but also for recognizing and incorporating learning technologies as catalysts for student autonomy and self-management. This initiative reinforces the idea that self-directed learning can be enhanced through innovative pedagogical approaches and the effective integration of educational technologies.

The Open University of the United Kingdom (OUUK) stands out as a higher education institution committed to providing high-quality distance education opportunities for everyone who wants and has the ability to study. OUUK's educational structure is characterized by the availability of various resources, such as printed study materials, online content, tutorials, and discussion forums. In addition, students are encouraged to progress at their own pace, tailoring the learning process to their individual needs. Educational support at OUUK includes individual and group tutoring sessions, providing personalized *feedback* and support throughout the learning journey (Maia; Meirelles, 2002).

OUUK's approach is based on the belief that self-directed learning is an effective strategy for lifelong learning. By adopting this practice, the institution seeks to empower students to become independent and autonomous in their learning, developing fundamental skills, such as critical thinking and problem-solving, that are essential for professional success. However, recognizing the challenges inherent in self-directed learning, especially for those less familiar with this approach, OUUK offers

ongoing support to students. This encompasses regular tutorials, personalized *feedback*, and technical assistance, ensuring that learners can overcome challenges and achieve success in their self-directed learning journey (Maia; Meirelles, 2002).

OUUK stands out as a benchmark in distance education and self-directed learning, reinforcing its commitment not only to the dissemination of knowledge, but also to the continuous development and autonomy of students in their pursuit of lifelong learning.

Finally, another institution that uses instructional design as a strategy to promote self-directed learning is the Open University of Brazil (UAB). UAB is a program of the Ministry of Education (MEC) that aims to democratize access to higher education by offering undergraduate and graduate courses in the distance modality. UAB is composed of a network of public higher education institutions that offer undergraduate and graduate courses in the distance modality throughout the national territory (Santos, 2011).

Self-directed learning is one of the guiding principles of the methodology adopted by UAB. In line with this principle, the institution implements pedagogical strategies aimed at student autonomy and independence. One of these strategies is the offer of virtual classes, which allow the student the flexibility to study at their own pace and at the most convenient times. In addition, UAB's courses are offered in a virtual learning environment and are meticulously planned to provide a flexible and personalized learning experience. Students have access to a variety of learning materials, including videos, texts, animations, educational games, and discussion forums. Autonomy is encouraged, allowing students to establish their learning objectives, select the most pertinent teaching materials and interact with peers and tutors through synchronous and asynchronous communication tools, search for information from different sources, compare them and produce a text or presentation that reflects their understanding of the subject (Oliveira, 2014).

Virtual discussion forums are a common practice at UAB, providing interaction between students and professors to exchange ideas and clarify doubts. This collaborative interaction stimulates the development of students' self-management and self-discipline (Oliveira, 2014).

UAB's instructional design includes several actions, from the elaboration of concept maps for the organization of knowledge to the provision of self-assessment activities, allowing students to monitor their own learning. Adaptive systems adjust the content and difficulty of instruction according to student performance. In addition, the assessment of learning is promoted through individual and group projects, written assignments, and presentations, encouraging critical reflection and the practical application of knowledge (Santos, 2011).

In summary, UAB adopts self-directed learning as a central pillar in its distance learning methodology, recognizing it as essential for the development of the student's autonomy and responsibility in their own learning process, preparing them for the challenges of academic and

professional life. The institution stands out as an exemplary model of effective integration between instructional design and self-directed learning in distance education.

3 FINAL THOUGHTS

In view of the above, the unequivocal conclusion emerges that self-directed learning is a paradigmatic approach that emphasizes the responsibility and autonomy intrinsic to the learning process. In this context, students assume full responsibility for planning, controlling and evaluating their own educational trajectory, outlining, autonomously, strategies for searching for information and resources. This learning modality undeniably proves to be highly effective for intrinsically motivated and self-disciplined students, although it presents considerable challenges for those who face difficulties in time management and maintaining intrinsic motivation. For this approach to be effective, careful instructional design planning is imperative, and it should be guided by the individual nuances of the learner and their learning trajectory. Additionally, the incorporation of learning technologies emerges as a valuable tool, providing personalized resources and activities, meticulously aligned to the individual needs of students.

Within the framework of an online course aimed at continuing education of professionals, self-directed learning reveals itself as a particularly auspicious proposal. The inherent advantages of such a modality include the flexibility of time and place of study, allowing students to adapt the course to their own needs and responsibilities. In addition, the continuous accessibility of the course, at any time, gives students the opportunity to shape their learning process according to their individual pace. However, it is imperative to consider that this learning modality requires a substantial investment of effort and self-discipline on the part of students, a determining element for successful performance.

In the process of designing said course, the instructional designer takes a crucial role in incorporating strategies and resources designed to assist students in setting learning goals, monitoring progress, and autonomous assessment. This professional, in a proactive way, can provide structured guidance for students to identify resources and sources of relevant information, in addition to developing activities that stimulate critical reflection and practical application of the content absorbed. In summary, instructional design designs a structure and offers direction that guides students through the intricate process of self-directed learning, giving substance to its effectiveness.

Therefore, the magnitude of instructional design in the implementation of self-directed learning is emphasized, highlighting its fundamental role in the success of teaching and learning processes in the context of distance education. In addition, educational institutions are urged to embrace flexible and personalized approaches, enabling students to take full control of their learning process, while providing the guidance and resources essential for the autonomous achievement of their educational goals. In this scenario, educational institutions emerge as essential facilitators in the cultivation of

autonomy and responsibility intrinsic to the learning process, thus shaping professionals endowed with the inherent ability to face the multifaceted challenges of the contemporary scenario.

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