Education, Artificial Intelligence, and the Digital Age

Ovidiu Folcuț[1], Otilia Manta[1], Iuliana Militaru[1]

1 Romanian-American University

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Abstract

In this paper, the main objective is to identify and highlight the factors that influence the current model of education in the context of artificial intelligence and the digital age. Moreover, based on the new innovative learning tools, the education models that can contribute to a society subject to multiple challenges and constantly adapting and changing are analyzed.

Study design/methodology/approach: research tools are based on empirical research, analysis of specialized scientific literature, both those related to the traditional model, but especially those of the progressive model based on tools specific to the digital era (for example, educational platforms, software - used in the educational process of knowledge, as well as the recent tool ChatGPT). In addition, as well as getting expert opinions on these new learning tools, the open questions have been launched on ResearchGate.The results of our research highlight learning models based on the closest possible cooperation between universities and industry, the adaptation of the educational curriculum to new jobs in the context of the use of artificial intelligence, as well as the promotion and use of innovative tools in the academic educational act, in order to determine the applicability of innovative knowledge acquired, in the economic environment, in support of the development and sustainability of the economy and society, locally and globally.

Originality/value: the contribution of this work to highlighting the learning models identified in the specialized literature, proposing one of the models specific to our university education system, as well as highlighting the fact that AI is a resource that supports human efforts in education, respectively optimizes processes, and does not replace the creative side of the teaching staff involved in the educational process, thus contributing to the achievement of outstanding academic results.

Ovidiu Folcuț[1,a], **Otilia Manta**[1,2,b,*], and **Iuliana Militaru**[1,c]

[1] *Romanian-American University, Bucharest, Romania*

[2] *"Victor Slăvescu" Centre for Financial and Monetary Research, Romanian Academy, Bucharest, Romania*

[a] ORCID iD: 0000-0003-1021-5454

[b] ORCID iD: 0000-0002-9411-7925

[c] ORCID iD: 0000-0002-6414-1772

[*] Corresponding author, Otilia Manta – e-mail:otilia.manta@rgic.ro

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Introduction

It is very obvious, the fact that education models are in a continuous transformation, transformation generated by multiple factors, especially in the context of the digital era, respectively the phenomenon of artificial intelligence (AI), which continues to be very dynamic and which it causes us to adapt permanently to the changes brought by this technology, in all fields of activity. All the tools used in the act of knowledge, respectively in the educational process, are based on digital technologies, and in this situation, AI, we appreciate that they will play a significant role in the transformation of the educational system, thus contributing to the improvement of the act of knowledge, the process of learning (optimization of work times and results), very rapid access to information (for example the research tool, bibliometric analyses, currently helps us to have information from thousands of scientific sources, which confirm or refute our working hypotheses) and personalization of the learning experience, respectively of the learning models (focusing knowledge on the student's abilities and orienting him directly to the labor market, which is in constant change).

Review of the Scientific Literature

Of course, to develop a deep understanding of the current model of education in the university environment, in the context of the digital age, it is important to consult a variety of bibliographic sources. Starting from this consideration, we exemplify our research based on specialized literature, as follows: in the work (Davidson C.N, 2022), the author presents the current challenges and opportunities in higher education and also proposes a revolutionary perspective on university education. Also within this work, (Davidson C.N, 2022), supports the need for a new theory that defines the education model, as well as clear applicative elements oriented towards academic performance and less on the score obtained by the student on the evaluation test, offering- and thus the student, the possibility to adapt to the existing changes in the labor market and with clear objectives of both personal and societal performance. In this work, Davidson C.N, 2022) proposes solutions regarding the restoration of the entire process of higher education and suitable for each type of academic institution. In our quest to identify bibliographic resources that support our scientific argument for optimizing educational processes in the university academic environment, the paper (Nyquist JG at all, 2013) addresses how technology can be integrated into the learning process and how to maximize its impact in university education. Moreover, in the work (Nyquist JG at all, 2013)"Strategies for the universities of the future" there are surprise elements of change from education oriented to local needs, to the availability to train the young generation, to global mobility, based on the elements of knowledge cognitive oriented towards global societal needs. (Nyquist JG at all,

2013) sends an exhortation for decision-makers in the university environment to support teaching staff and transfer the act of knowledge and training to the digital age (of the Internet). It is reconfigured by the authors (Nyquist JG at all, 2013) how the campus of the future will look for students, especially in the field of higher medical education which will be subject to major challenges, challenges that we are experiencing today in the academic environment, respectively what skills must to have the medical student in the digital age. In the context of the COVID-19 pandemic, educational models and practices have seen a rapid transformation and adaptation to this new context. (Vásquez Astudillo, M., 2020) analyzes from a methodological point of view and based on different knowledge tools (digital platforms, hybrid learning, online and other adapted forms) pedagogical models, but especially the practices used by teachers in the entire educational process. The Blended Learning model (Vásquez Astudillo, M., 2020), which was not only promoted but also implemented at the university level ten years ago, in which the teaching and learning process was based on tools both for online teaching and and for the classic system (in the room with the students), depending on the cases analyzed, as well as depending on the terrors addressed. Moreover, (Vásquez Astudillo, M., 2020), supports the way of teaching in the classroom with all the digital support tools for students, the teacher having multiple roles, as a designer of a study, as a student-centered lesson guide, as a facilitator based on the software used, but especially by the manager of the discipline in the act of knowledge. The model (Vásquez Astudillo, M., 2020), we could suggest that it represents a bridge between industries and university academia. (Cavanagh, S.R.,2016), the paper explores the role of emotions in the learning process and how they can be integrated into the current university educational model. Moreover (Cavanagh, S.R., 2016), it supports the orientation of the student in the knowledge process towards those values that will determine his orientation both in the professional field (giving the student knowledge, the desire to learn), but above all it shapes his character (developing and critical thinking) using emotions as teaching practices, exemplifying with cases in which the author was involved, (Cavanagh, S.R., 2016), supports the fact that in addition to the seminificative side of the act of teaching, the fun side is equally important, supporting through association concepts and determination of the student through emotions to knowledge. (Davidson C. N., at all, 2009) the paper explores the significant changes brought about by technology in higher education and how institutions must adapt. (Kachra R, at all, 2020), examines the impact of the COVID-19 pandemic on higher education and teaching and learning models. (Garrison D. R., at all, 2007), provides a detailed analysis of hybrid learning models and the principles that underlie them in higher education. Moreover, (Garrison D. R., at all, 2008), addresses the tools of efficiency in the act teaching in the university environment, with specificities oriented to different disciplines. (Garrison D. R., at all, 2009), presents in the paper also certain scenarios based on which he developed the fundamental research, namely the redesign of teaching models and with an adaptability and a transformation at the level of the curriculum in the university academic environment. (Conole G., 2013), explores how technology and open resources can transform education in the university environment. It is known to us tutors that for almost 20 years, technologies (including those specific to internet search engines) have influenced the way we identify bibliographic sources, prepare certain scenarios in our studies, and implicitly prepare educational curricula, especially in the university environment and its orientation towards industries. (Conole G., 2013), supports the fact that access to work in a computerized network is a fact, and the computer is the work tool in the act of knowledge. Moreover, (Conole G., 2013), emphasizes the existence of multiple technologies that universities have in equipping the material base, and teachers use them to optimize the educational process, as well as to achieve interactivity between teacher and student. (Conole G., 2013) claims that due to the multiple technologies, it is essential how the act of learning is designed and how we guide the student in the effective use of these technologies and which allows them to combine the knowledge acquired at the university with the multiple existing educational courses in open space, thus helping (Conole G., 2013) to rethink the entire learning process, thus making mixed learning possible (Conole G., 2013).

The comprehensive approach of our work led us to highlight some of the existing studies in the scientific literature in the field of education, especially in the process of rethinking the current training models in the university academic environment in the context of the digital era. Moreover, it is evident that since the end of last year, multiple debates have been focused on the ChatGPT tool as a support tool in the learning process, especially in the current digital age. Therefore, in the specialized literature we have identified several reference works on ChatGPT. Education in the context of the digital age is a topic of major interest in the specialized literature. This literature explores how digital technologies and digital transformation influence learning and teaching processes. (Bates A.W., 2022) and (Bates A.W., 2019), provide practical guides for teachers and instructors on how they can integrate technology into the teaching and learning process effectively. (NMC, 2017), this year's report analyzes emerging trends and technologies in higher education, providing an overview of changes in the field of digital education. (Lankshear, C., at all, 2008) explores digital literacy concepts and practices and how they affect learning in the digital age. (Garrison, D. R., at all, 2008) provides a detailed analysis of blended learning and how technology can be effectively integrated into the university environment. (SCHMEINK, L., 2016) and (Westera W., 2013), explore the extent of the changes brought by digital technology in society and in education. (Gabriel, M. At all, 2012) highlights the importance of adopting digital technology in education and argues for a pedagogy suitable for the digital age. (Lo, C. K.at all (2017) reviews research related to the flipped classroom teaching model and how technology has influenced this concept. (Means B., at all, 2009), United States Department of Education report of Americas summarizes research on online learning and its impact on academic outcomes. (Helsper, E. at all, 2009) addresses the myth of the "digital native" and assesses concrete evidence on how young people use digital technology for learning. (Xu Di. at all, 2019), which addresses the challenges and benefits of online learning, with a particular focus on higher education (Conole Gráinne, 2013).

Research Methodology

Research methodology tools the learning process in the context of the digital age and involves a systematic, well-structured approach to investigate and understand how digital technology influences learning. Therefore, within the research methodology we aimed to identify in the scientific databases SCOPUS, WoS and Elsevir which are the determining factors of the learning models in the context of our research topic. Furthermore, in July 2023, we launched an open question on the ResearchGate research platform (being a direct survey-based research method) namely "How do you see the evolution of artificial intelligence in the fields of education and finance?" What is the equilibrium model (HR and AI)?" with the aim of directly knowing the opinions of specialists in the field. Another research tool was given by the analysis of the specialized literature to identify the learning models supported in different works presented by the specialists in the field, i.e. an exhaustive review of the existing literature on learning in the digital age was carried out and theories were identified, relevant patterns and trends. The data with the opinions of the specialists (direct interview) were collected through the ResearchGate platform. The analysis of the answers formulated by the experts was done using specific tools and techniques, such as thematic analysis, respectively content analysis. The interpretation of the answers, the evaluation and validation of the results of our research, were valid and reliable, based on the existing data in the specialized scientific literature, as well as through the answers of the experts involved.

This research methodology is simplistic and can be adapted to the specifics of our research, given the fact that it is based on classic tools for identifying learning models in specialized scientific literature and with elements specific to the question structured and addressed in our research. Moreover, the feedback we received from experts in our research field ensured the validity and relevance of our work.

Results and Discussion

In order to define learning models and outline our own option in the context of this research, it is particularly important to know for learning programs in the context of artificial intelligence (AI) what are the factors that influence and shape the way education is designed, delivered and experienced. Here are some of the most important factors that have a significant impact on these programs:

1. *Technological Advances in AI:* Technological progress in the field of AI influences the development and implementation of learning programs. Data analytics, machine learning, and natural language processing capabilities are constantly evolving, opening up new possibilities for personalizing and enhancing the learning experience.
2. *Accessibility of technology:* The availability and accessibility of devices and internet connections are key factors in being able to implement technology and AI-based learning programs. Disparities in access can create inequalities in education.
3. *Students' needs and preferences*: Students have different needs and preferences in how they learn. AI can be used to customize learning materials, pace and teaching style to best suit the diverse needs of students.
4. *Labor market requirements:* Changes in labor market requirements influence the development of learning programs. Universities and educational institutions must take into account the skills and abilities needed to prepare students for future careers.
5. *Government regulations and policies:* Government regulations and policies can affect the development of learning programs in the context of AI, from cybersecurity standards to regulations on personal data protection and access to education.
6. *Financial resources:* The budget available for education and technology can influence the level of accessibility and quality of AI-based learning programs. Appropriate investments can lead to the development and implementation of more effective and innovative programs.
7. *Capacity and training of teaching staff:* The involvement and training of teachers and trainers in the use of AI-based technology and tools is essential for the success of learning programs.
8. *Ethics and data security:* Protecting students' personal data and addressing ethical issues related to the use of AI in education are important concerns that can influence how learning programs are developed and implemented.
9. *Feedback and continuous evaluation:* The reception and feedback of students, as well as the continuous evaluation of the effectiveness of programs, play an important role in adapting and improving them along the way.
10. *Institutional culture and values:* The values and culture of an educational institution can influence decisions regarding the implementation of technology and AI in learning programs.

All of these factors must be considered when developing and implementing AI-based learning programs to ensure they are effective, accessible, and ethical (Manta O, 2023). In our paper we start from these factors mentioned above, and which of course will influence our option, the research team, on a learning model, we first define the knowledge of the key aspects of the education model based on AI and which are models of learning in different universities internationally, patterns identified through our research:

1. *Personalization of learning:* AI can analyze each student's behavior and performance and provide personalized recommendations for teaching materials, learning pace and teaching style. This helps to maximize individual progress and develop each student's specific skills.
2. *Teacher Assistance:* AI can assist teachers in grading papers, classroom management, and creating educational content. It can also provide useful analysis of student performance and suggest more effective teaching strategies (Arize, Chuck, 2023).
3. *Access to educational resources:* AI can contribute to the creation and distribution of high-quality educational resources, such as interactive online courses, tutorials and tailored educational materials. Thus, access to quality education can be ensured in any geographical location.
4. *Innovations in the assessment process*: AI can revolutionize the assessment process by using more accurate and objective methods, such as automatic assessment of tests or written papers, thus reducing subjectivity in assessment.
5. *Lifelong learning:* AI can facilitate the development of lifelong skills by providing courses and learning resources tailored to individual needs and changing labor market demands.
6. *Ethics and Security:* In implementing AI in education, it is essential to pay special attention to ethical and security aspects. It is important to ensure the protection of students' personal data and to avoid discrimination or prejudice in AI recommendations.
7. *Developing AI skills:* Education should also include learning about AI and developing the skills needed to understand and use AI technology responsibly.
8. *Collaboration between humans and AI:* It is important to emphasize that AI should be a resource that supports human efforts in education, not completely replace them. Teachers and students should collaborate with AI to get the best results.

In conclusion, the implementation of artificial intelligence in education can bring many benefits, but the issue related to ethical and security aspects must be approached with care and attention. An AI education model should focus on personalizing learning, supporting teachers, and promoting access to quality education for all.

Education is a dynamic field that has seen significant evolution over the years. The analysis of the specialized literature as structured above in the paper, brought to the fore different models of education, based on their specific elements from a theoretical point of view and with their implications for teaching and learning. By analyzing the existing literature, we can gain a comprehensive understanding of various approaches to education.

The traditional education model

The traditional education model, often referred to as the "sage on stage" approach, has been the dominant teaching method for centuries. It involves a teacher-centered approach where instructors impart knowledge to passive students. Although this model has been criticized for its lack of student engagement and critical thinking, it continues to be prevalent in many educational settings.

Progressive education model

Progressive education models, such as those advocated by educators such as John Dewey, emphasize active learning and student-centered approaches. These models prioritize experiential learning, critical thinking, and problem solving. Research has shown that progressive education can increase student motivation and engagement.

Online and blended learning models

With the advent of technology, online and blended learning models have gained prominence. These models use digital tools and the Internet to deliver education. Online learning allows for flexibility, personalized instruction, and access to a wide range of resources. Blended learning combines online and in-person instruction, providing a hybrid approach that combines the benefits of both.

Constructivist and socio-constructivist models

Constructivism and socio-constructivism focus on the idea that learners actively construct their knowledge through interaction with their environment and peers. These models emphasize

collaborative learning, group activities, and the importance of social interaction in the learning process. They align with contemporary educational theories that emphasize student engagement and autonomy.

Competency-based education

Competency-based education models emphasize the acquisition of specific skills and competencies rather than traditional grades or credits. Students progress at their own pace and assessments are based on demonstrated competence. This model is gaining popularity, especially in professional and higher education settings.

Models of cultural and inclusive education

Cultural and inclusive education models promote diversity and equity in education. These models recognize the importance of considering the cultural background, individual needs and abilities of students. Culturally responsive teaching and inclusive education practices have become essential components of modern education.

It is essential that, in addition to the models identified in the specialized literature, we know the opinion of specialists in the field. This was also the real reason for launching the open question on the researchgate network, and to which we had different reactions and answers, respectively: (Hasan, S., 2023) clearly states that the future belongs to AI in multiple fields of activity, including education, being clearly motivated by the optimization of processes and the reduction of costs through the accuracy of operations and the limitation of risks. Moreover, a redaction of the desired service quality is also clearly mentioned. (Arize, C., 2023), which through the given answer highlights the fact that the progress made in AI education and finance is evident, directly contributing to student progress and performance, with student-centered and personalized learning elements of their skills and capacity, as well as with a good automation of the administrative elements specific to the act of knowledge. (Arize, C., 2023),"The HR-AI balance model is a concept that aims to integrate the strengths of both human resources and artificial intelligence. The equilibrium model is designed to ensure that AI is used to augment human resources rather than replace them (Tong L, at all, 2022). The balance model is based on the idea that AI can be used to automate routine tasks, while human resources can focus on more complex tasks that require human reasoning and decision-making."

Artificial Intelligence made and makes the academic environment as connected as possible to the direct needs of industries (SCHMEINK, L., 2016), therefore the learning model in the university environment currently starts from the cooperation between universities and industry, which is essential to promote innovation, economic development and to prepare students for the demands of today's labor market. This collaboration can take many forms and bring benefits to both academic institutions and businesses (Westera W., 2013). Here are some ways universities and industries can cooperate:

1. *Collaborative research projects:* Universities and companies can work together on research projects aimed at developing new technologies, products or solutions to industrial problems. These projects can attract additional funding and contribute to the advancement of science and technology.
2. *Internships and Internships:* Companies can offer internships and internships to students to develop their practical skills and gain field experience. This gives companies an opportunity to identify and recruit talented young people.
3. *Customized training programs:* Universities can develop customized training programs to meet the specific needs of an industry or company. This may involve developing tailored courses or certification programs.
4. *Exchange of experts and resources:* Exchange of experts and resources between universities and companies can facilitate the transfer of knowledge and skills. Companies can benefit from academic expertise, while universities can gain access to advanced resources and equipment.
5. *Research and innovation centers:* Universities and companies can establish joint research and innovation centers to tackle complex problems and develop cutting-edge technologies. This can attract government funding and financial partners.
6. *Technology transfer:* Universities can help transfer technology to companies, facilitating the commercialization of products or services based on academic research.
7. *Events and conferences:* Organizing joint events and conferences can promote dialogue between universities and industry, facilitating collaboration and the exchange of ideas.
8. *Competitions and collaborative projects for students:* Universities and companies can organize competitions and collaborative projects for students, giving them the opportunity to apply their knowledge in a real context and solve practical problems.

The model that we appreciate is as anchored as possible in economic realities, is given by the*collaboration between universities and industry* (Vásquez Astudillo, M., 2020) and which can contribute to the development of a better trained workforce, to academic and industrial innovation, and to the advancement/welfare of society as a whole. It is important that this collaboration is based on trust, transparency and respect for ethical and academic standards. Moreover, the development of artificial intelligence (AI) systems in the context of learning programs has had a significant impact on the transformation of education. These systems can enhance learning, personalize the learning experience, and provide more effective educational resources. Here are some key aspects of developing AI systems in learning programs:

1. *Adaptation to individual needs:* AI systems can analyze data about each student's progress and preferences and provide tailored content. This helps ensure that students can learn at their own pace and that resources are appropriate for their knowledge levels.
2. *Personalized recommendations:* AI systems can make recommendations for learning materials, courses or exercises based on students' past performance and their learning goals.
3. *Adaptive learning:* AI can adjust the difficulty or pace of exercises to suit each student's skill level, ensuring continuous progress (Xu Di at all, 2019).
4. *Automated grading:* AI systems can automatically grade papers, tests, and exercises, providing instant feedback. This reduces the burden on teachers and gives students the opportunity to improve their skills in real time.
5. *Support for teachers:* AI can help teachers in planning lessons, identifying specific needs of students and providing recommendations to improve the teaching process (Zhang, R., at all, 2022).
6. *Natural language-based learning:* Natural language-assisted learning technologies allow students to interact with AI systems through natural language, thereby facilitating access to information and real-time assistance.
7. *Simulation learning:* AI can be used to develop realistic simulations and interactions for hands-on learning in fields such as medicine, engineering or natural sciences.
8. *Engagement and stress monitoring:* AI systems can detect students' engagement levels and provide feedback on their stress or anxiety levels, thereby helping to manage their well-being.
9. *Data analysis to improve learning programs:* AI can analyze data collected during the learning process to identify trends and help educational institutions improve their programs and streamline resources (Zhao, L., at all, 2022).

The learning process in the context of current challenges can benefit from the use of tools and technologies that facilitate access, efficiency and flexibility of learning. Here are some key tools that can

be helpful in this regard:

1. *Online learning platforms:* Such platforms as Moodle, Blackboard, Canvas or Google Classroom allow educational institutions to create and administer online courses. They provide the ability to upload teaching materials, organize activities, assess students and facilitate communication between teachers and students.
2. *Video conferencing tools:* For distance or hybrid learning, tools such as Zoom, Microsoft Teams, Google Meet or Skype can facilitate real-time communication between teachers and students. They allow for online lessons, discussions and group collaborations.
3. *Massive Open Online Courses (MOOCs):* MOOCs such as Coursera, edX or Udacity provide access to online courses in various fields. These are often created by prestigious universities and can be followed globally.
4. *Content Management Platforms:* Tools like WordPress or Joomla can be used to create and manage online educational content, including blogs, websites or interactive learning resources.
5. *Content creation tools:* Camtasia, Articulate Storyline, Adobe Captivate and others allow teachers to create interactive learning materials such as video tutorials, presentations or simulations.
6. *Digital Libraries:* Access to online resources such as PubMed for medical sciences, JSTOR for academic research or ProQuest for diverse databases provides students and researchers with a wide range of materials and sources of information.
7. *Online collaboration tools*: Google Docs, Microsoft Office 365 and other online collaboration tools facilitate teamwork and sharing of documents and projects in real time.
8. *Adaptive learning platforms:* These use artificial intelligence to personalize the learning experience, providing students with exercises and materials tailored to their skill level and learning pace.
9. *Online assessment tools:* Apps like Kahoot!, Quizlet or Edpuzzle allow teachers to create interactive online tests, surveys and assessments to monitor student progress.
10. *Time management and organization tools:* Apps like Trello, Asana or Google Calendar can help students and teachers organize their learning activities and manage their time efficiently.

These tools can be used to address current challenges in education, such as distance learning, personalization of learning, and online collaboration. However, it is important to ensure that the use of these tools is consistent with learning objectives and that students' needs and preferences are taken into account in order to create an effective and motivating learning environment.

These resources can provide a solid foundation for understanding the evolution and impact of digital education in the context of the digital age. It is important to continue to explore the literature to stay abreast of the latest research and trends in this ever-changing field.

Figure 1. Factors influencing the education model

Source: Persistent misbehaviour challenges teachers more than student violence and aggression, Anna Sullivan, 2014

In the education model, an essential aspect is given by the way of teaching and the learning tools oriented to the student. A relevant example of the learning model is given by La Moonee Ponds Primary School (MPPS), which in their philosophy an essential aspect is that each student, based on personal ability, has a very good level oriented in all areas specific to the curriculum. Therefore according to this philosophy, the individual talents of the students are recognized at the institutional level, and the student is driven to acquire personalized knowledge. Furthermore, excellence is respected and recognized through academic rewards, thus leading to the development of each student's personal confidence. The development of the student-centered curriculum gives confidence, openness, critical thinking, stimulation, positivism and the desire to know, and with the direct objective of stimulating each student on the path of knowledge. Through this program, students are stimulated and supported to actively contribute to societal development by being active, determined, positive and confident individuals in academic and societal values (Means B., at all, 2009).

The learning model within this institution starts from the extensive research of existing models on an international level and adapted to institutional realities, thus the results of the research are transposed into the Institutional Strategic Plan, with a clear orientation on improving knowledge at the student level (Cavanagh, S.R., 2016), respectively raising the level of training and its orientation towards performance, determination and engagement, as well as personal and societal well-being.

The MPPS learning model articulates teaching/learning procedures as well as policies at the level of the educational institution. All these specificities are given and oriented towards the collaborative education model, thus contributing to a high-performing educational environment.

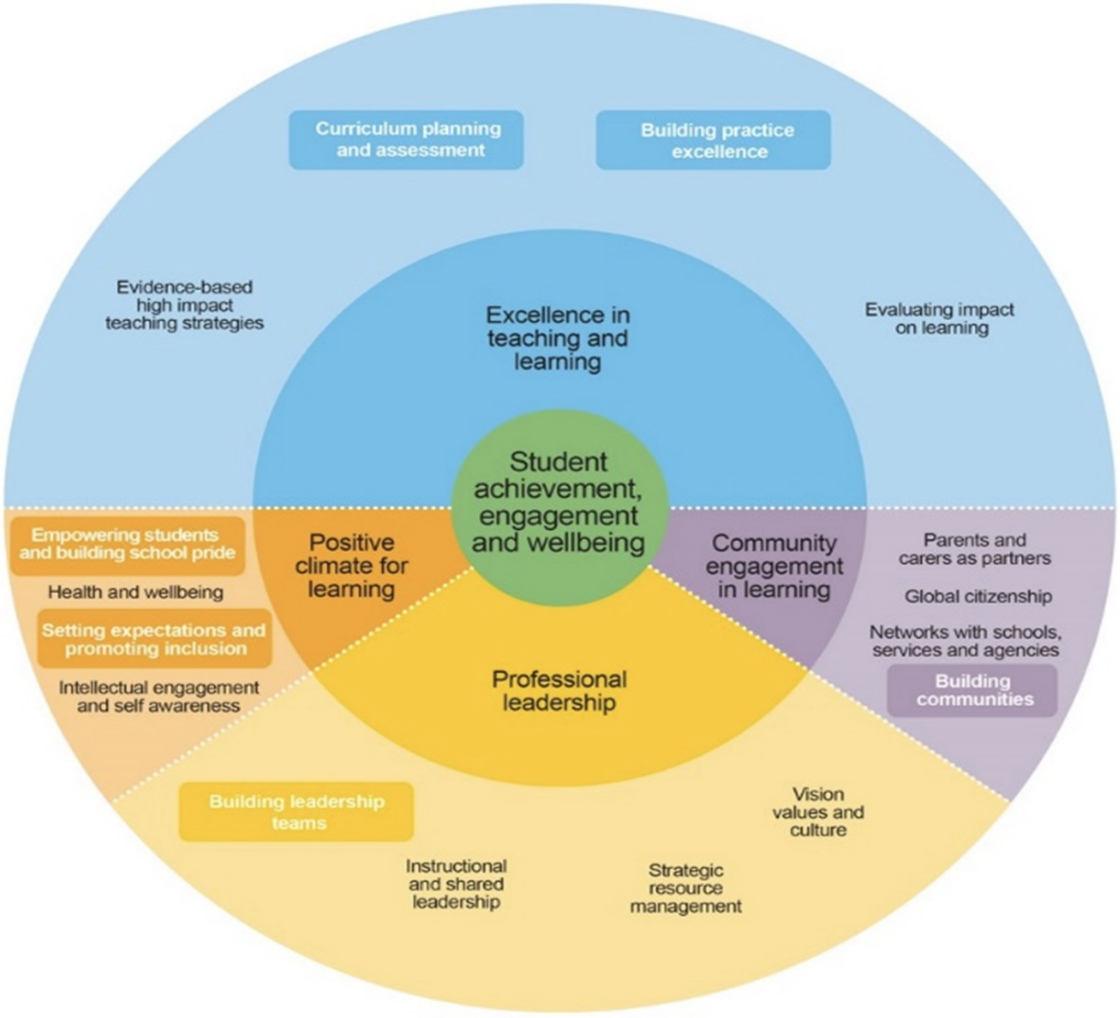

Figure 2. The MPPS learning model
Source: MPPS

This learning model contributes to a positive community influence, with effective orientation towards the economic environment of the engagement area, based on four key priorities:

✓ *Excellence and performance in the act of teaching and learning;*

✓ *Performed management and leadership based on professional skills;*

✓ *Positive climate at the institutional level for learning;*

✓ *Involvement of all community actors in the learning process.*

It is obvious that for any of the education models in the context of the digital era, orientation has a double value, respectively: the use of all tools to raise the personal performance of students and the involvement of the community to connect the academic environment to the economic environment (Manta, O., 2021), their involvement being, moreover, the basic pillar for societal well-being at the local level and implicitly at the global level.

It is essential to know based on the specialized literature which are the most relevant support initiatives, and which support education models to help increase the results of student performance, well-being and engagement in learning, and these are:

✓ *Building excellence in practice*: teachers, principals and schools will work together to share knowledge and ideas, develop and strengthen approaches to teaching and assessment, build a culture of collaboration, master the use of learning interventions and student data and will improve feedback for students and staff.

✓ *Curriculum planning and evaluation:* Schools will embed a culture of curriculum planning and evaluating the impact of learning programs and adjusting them to suit individual student needs so that students can reach their potential. Schools will strengthen their use of assessment data and student feedback to assess student progress, monitor the impact of teaching, and adjust learning programs and interventions (Nyquist JG, at all, 2013).

✓ *Building leadership teams:* Schools will strengthen their succession planning, build the capacity of their leadership teams to use evidence and proven coaching and feedback methods, build a culture of trust that focuses on improvement, and strengthen the induction of new teachers into professionals. their school's learning culture.

✓ *Empowering students and building school pride:* Schools will develop approaches that give students a greater say in decisions that affect their learning and school life. The whole school community will engage with students so that they have a voice in their learning and participate fully and proudly in school life.

✓ *Setting expectations and promoting inclusion:* Schools will work in their communities to implement a shared approach to support the health, well-being, inclusion and engagement of all students, including setting behavioral expectations, building teachers' understanding of positive classroom behavior and practices engagement and ensuring students have the tools and skills to develop positive and self-regulating behaviors.

✓ *Building Communities:* Schools will strengthen their capacity to build relationships with the wider community by partnering with the community sector and providers, strategically use existing community resources and capacities and increase services provided 'inside the school'.

Schools will realize the value of harnessing the full capacity of the community and parents to collectively encourage student learning and improve student achievement. At the national level, there is a clear need to rethink learning models in the context of artificial intelligence based on the data below, respectively:

Table 1. The network of university institutions in the period 2011-2020

	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020
No. higher education institutions, of which:	108	107	103	101	99	97	95	92	90
- state property	57	56	56	56	56	56	56	55	55
- private property	51	51	47	45	43	41	39	37	35
No. faculties, of which:	614	596	590	583	567	560	554	545	546
- state property	410	405	405	403	409	405	406	406	407
- private property	204	191	185	180	158	155	148	139	139

Source: Data taken from the Statistical Notebooks on Higher Education, INS, 2012-2020

Regarding the data presented in the table 1, the following are highlighted: no. of higher education institutions: the total number of higher education institutions decreased from 108 in 2011/2012 to 90 in 2019/2020; the number of state-owned institutions decreased gradually over the years, from 57 to 55; the number of private institutions decreased from 51 to 35 over the same period.

Regarding the number of faculties: the total number of faculties decreased from 614 in 2011/2012 to 546 in 2019/2020; state-owned faculties decreased from 410 to 407, while private faculties decreased from 204 to 139.

There is a general trend of reduction in both the total number of higher education institutions and faculties. The number of private institutions and faculties shows a more significant decline compared to state-owned ones. It would be interesting to investigate the reasons behind these changes, such as shifts in educational policies, economic factors, or demographic changes.

Table 2. The number of students enrolled in university units, bachelor (thousands)

	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019	2019/ 2020
No. students in undergraduate education, of which:	539,9	464,6	433,2	411,2	410,7	405,6	408,2	402,7	407,4
- state property	399,5	364,9	354,0	345,3	351,5	350,1	352,3	348,5	351,7
- private property	140,4	99,7	79,2	65,9	59,2	55,5	55,9	54,2	55,6

Source: Data taken from the Statistical Notebooks on Higher Education, INS, 2012-2020

Starting from these concrete and corroborated data and the events that accelerated the readjustment of learning models in the university environment, as well as its orientation to the economic environment and to a labor market in a reset of jobs in the context of the digital era.

Regarding the data presented in the table 1, the following are highlighted:

- total undergraduate enrollment: the total number of students in undergraduate education fluctuated over the years, ranging from 411.2 thousand in 2014/2015 to 539.9 thousand in 2011/2012. There's a slight increase in recent years, reaching 407.4 thousand in 2019/2020.
- state property vs. private property: the majority of undergraduate students are enrolled in state-owned institutions. State property enrollment ranged from 345.3 thousand to 399.5 thousand. Private property enrollment is generally lower but has also experienced fluctuations. It ranged from 54.2 thousand to 140.4 thousand.

There is an overall trend of fluctuation in undergraduate enrollment, with a slight decrease in the mid-years followed by a gradual increase. State-owned institutions consistently enroll a larger number of students compared to private institutions.

The gap between state and private property enrollment appears to be narrowing in recent years. Factors influencing these trends may include changes in educational policies, population demographics, economic conditions, and the attractiveness of private vs. state-owned institutions.

This analysis provides a snapshot of the dynamics in undergraduate enrollment over the specified period. Further investigation into the mentioned factors could offer a more comprehensive understanding of the observed trends.

This is why, once again we reaffirm the fact that Artificial Intelligence (Zhang, R. at all, 2022) has led each of us actors involved in society to reorient and re-adapt to the current context, and the academic learning model to be as connected as possible to the direct needs of industries (Zhao, L., at all, 2022), and the cooperation between universities and industry, to support a sustainable multidisciplinary, transdisciplinary, interdisciplinary and pluridisciplinary development (NMC, 2017).

Conclusions

In conclusion, the current landscape of the academic domain, encompassing education and research, is marked by continuous evolution. The myriad of specificities, models, concepts, and approaches showcased in this literature review underscores the dynamic nature of teaching and knowledge shaping. The exploration of scientific literature in this study illuminates key educational models, ranging from traditional to progressive and online to inclusive, each presenting unique strengths and challenges.

Deciding on an educational model necessitates careful consideration of educational objectives, student needs, and contextual factors. In this regard, we endorse the model proposed by Vásquez Astudillo (2020), advocating for an alignment with the immediate requirements of both national and global economies. As educators and researchers delve into these models, the future of education emerges as dynamic and responsive to societal changes, intricately linked to economic realities on local, national, regional, and international scales.

While the integration of Artificial Intelligence (AI) brings substantial benefits to education, it demands a responsible and ethical approach. Safeguarding students' personal data and ensuring the elimination of discrimination are crucial aspects in the development and implementation of AI systems. It is imperative to underscore that teachers remain indispensable in the educational process, with AI serving as a supportive tool rather than a replacement.

The analysis of the existing models in the specialized literature recognizes certain limitations due to the absence of detailed statistical data on each identified learning model. However, these limitations also present an opportunity for our research team to further explore the field of university academic training.

Future efforts aim to contribute new data and arguments specific to learning models in the context of the digital age, the green age and other emerging challenges, all directly influenced by the remarkable progress of artificial intelligence. It is critical that we harness this progress judiciously to improve student achievement, academic progress, and societal well-being.

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