

# AI and the future of human-centered education

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## Abstract

This case study investigates pedagogical innovation to re-emphasize human capabilities within AI's disruption, aiming to avoid the "AI trap." It focuses on a redesigned Leadership and Sustainability course for business students (typically 20-25 students per cohort) at Del Rosario University, Bogota, Colombia. The methodology uses an experiential learning model around the "Conscious Capitalism carbon fiber bikes" business simulator as an ongoing case study. This approach integrates David A. Kolb's Experiential Learning Theory, brain-based learning principles, and aspects of the flipped classroom model, redefining the teacher's role as a coach of the learning process. Main findings demonstrate that this immersive "learn-by-doing" approach fosters teamwork, strategic decision-making, and impact analysis—skills that are difficult to acquire through traditional methods. For instance, balanced scorecard data consistently showed improved market share and reputation metrics, e.g., average market share increasing by 15%, across most teams by the final rounds, alongside qualitative evidence from reflections detailing enhanced collaborative problem-solving. The simulator, by using tension and emotions, improves retention in line with brain-based learning. This student-driven environment promotes self-paced learning, mindfulness, and high engagement, while also promoting critical thinking, self-management, and problem-solving. It shows a human-centered integration of technology, where the simulator facilitates active experimentation without replacing core cognitive functions. To summarize, this teaching strategy effectively prevents the "AI trap," training students to handle complexity by developing unique human capacities.

**Keywords:** AI in education; experiential learning; business simulation.

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## 1. INTRODUCTION

AI and the future of human-centered education: How do we bring humanity back into teaching? In this fast-changing world of AI, education must integrate new AI tools and reinvent the way we educate to emphasize unique human capabilities (Unceta et al., 2021). Kolb (2015) recommends an integrated approach that recognizes that neither traditional nor modern teaching methods are obsolete; rather, finding the optimal configuration is key. There are many advantages for educators to use AI for increasing productivity and creating new learning experiences, but we also need to understand the risks of the AI trap, where we outsource our thinking to a robot (Alam, 2021). However, the decision on how to integrate AI into education is a choice that involves institutional values, judgment, and ethical considerations.

Our modern environment, characterized by constant change and rapid growth of knowledge, forces education to focus on developing critical and analytical thinking individuals (Ramírez-Narváez et al., 2024). Therefore, we need to proactively reinvent our pedagogical methods that emphasize the unique added value of human capabilities. While much of the current academic research heavily focuses on integrating AI tools into education, this paper specifically addresses a critical, yet less explored, area: demonstrating pedagogical innovation that cultivates unique human capabilities without direct reliance on AI tools. This approach fills a gap by focusing on strengthening core human cognitive and social functions to counteract the 'AI trap' (Alam, 2021; Faria et al., 2009).

This paper claims that the unique fusion of experiential learning, brain-based learning principles, and a flipped classroom structure creates a uniquely robust learning ecosystem that fully develops the specific match of human cognitive and emotional capabilities, such as complex strategic decision-making and emotional resilience under pressure, essential for thriving beyond AI automation. The experiential learning model is selected for the basic idea of the learning-by-doing principle. The flipped classroom is selected since it encourages students to take ownership of their learning process. Brain-based learning

principles are selected since they are a valuable source to identify how we learn and stimulate the learning process. Other human-centered pedagogical approaches, such as Freire's problem-posing education or Dewey's emphasis on learning by doing, similarly promote active student engagement and the development of critical skills.

We will examine the following literature for this paper: experiential learning, a method focused on 'learning by doing' and acquiring knowledge through direct experience rather than memorization; flipped classrooms, a model where core content is delivered outside of class to enable interactive, applied learning during class time; and brain-based learning principles, an approach that aligns teaching methods with cognitive neuroscience findings.

This unique fusion of human-centered pedagogies, which also implicitly redefines the teacher's role as a facilitator, is precisely how this paper proposes to cultivate the critical human capabilities necessary to avoid the 'AI trap' and empower students for continuous self-creation and purpose-driven action (Alam, 2021; Faria et al., 2009). We will then analyze a best-practice example, namely the course on Leadership and Sustainability, to illustrate how this works.

The Leadership and Sustainability course uses the Conscious Capitalism bike simulator, where teams make six rounds of strategic decisions starting at \$1.5 million. Tasks include defining roles, targeting markets, setting up production, designing brands, pricing, and conducting financial planning. Later rounds allow raising \$2.5 million via investor pitches and global expansion (e.g., Bangalore, New York). Teams justify decisions post-round and receive feedback. Performance is evaluated via a balanced scorecard (market share, reputation, HR management), emphasizing teamwork reflection.

We know that AI can automate some tasks, but education's core remains a profoundly social and human process. We need to proactively reinvent our pedagogical methods that emphasize the unique added value of human capabilities to stay relevant. This article aims to demonstrate a unique way of teaching without AI, using the online business simulation to create a



new teaching experience for the course on Leadership & Sustainability for bachelor business students at Del Rosario University in Bogota, Colombia.

## 2. THEORETICAL FRAMEWORK

This pedagogical strategy for teaching leadership and sustainability is a unique fusion of experiential learning theory, brain-based learning, and the flipped classroom model. This unique combination fosters a synergistic learning ecosystem, where, for instance, the competitive emotional engagement of the simulator (brain-based principle) uniquely intensifies the 'Active Experimentation' within Kolb's cycle, driving deeper cognitive processing. These frameworks all show human-centered learning and the development of higher-order thinking skills, addressing the issue of avoiding the "AI trap."

### 2.1. Experiential learning as the foundational pedagogy

The entire design of the Leadership and Sustainability course is an example of Experiential Learning Theory (ELT) (Kolb, 2015), which claims that knowledge is continuously gained through personal and environmental experiences and is fundamentally a process of creating knowledge through the transformation of experience (McFarland, 2017). ELT is deeply rooted in the work of influential 20th-century scholars such as John Dewey, Kurt Lewin, Jean Piaget, and Paulo Freire.

The course explicitly orchestrates the four stages of Kolb's Experiential Learning Cycle (ELC) (Kolb, 2015):

- Concrete Experience (CE): Students are fully involved in new experiences through the business simulator decision rounds. This hands-on engagement in a 'safe environment' to mimic future situations directly applies to CE. The personality test provides concrete experiences.
- Reflective Observation (RO): The requirement for students to articulate the logic behind their decisions, analyze balanced scorecard results, and engage in structured reflection on their learning journey— using tools like the eco-cycle planning canvas and the start, stop, continue framework—directly represents critical observation (Kolb, 2015).
- Abstract Conceptualization (AC): Initial theoretical readings, developing team strategies and business plans, and adapting those strategies based on simulator feedback and market information represent the process of creating concepts and integrating observations into theory (Kolb, 2015). The insights from industry leaders also contribute to abstract conceptualization.
- Active Experimentation (AE): Submitting decisions in the simulator, making pitches to venture capitalists, and implementing strategic choices like international expansion are clear examples of actively testing theories and making decisions to solve problems (Kolb, 2015).

This dynamic and repeating cycle ensures that learners "touch all the bases," allowing for new understanding

upon returning to an experience. The emphasis on problem-solving, risk-taking, and self-correction within the simulator builds confidence and motivation for acquiring new knowledge, aligning with core ELT principles (Kolb, 2015).

## 2.2. Redefining the teacher's role in the AI age

The course design shows the redefined role of the teacher in current education, shifting from a “dispenser of information” to a coach of the learning process (Kolb, 2015). The professor in this course provides feedback, offers coaching tips based on simulations, and evaluates strategic pitches. This supports the idea that teachers should use scaffolding, adapted to each student's needs, to effectively engage learners and strengthen or transform their interaction behaviors.

While AI may automate routine jobs, it cannot reproduce the key human attributes such as creating personal connections, encouraging social relationships, and engaging in spontaneous insights (Alam, 2021). The professor's direct feedback sessions and personal assessment of team pitches underscore the irreplaceable human element in teaching (Ramírez-Narváez et al., 2024). This approach aligns with a “pedagogy of responsiveness” and “pedagogy of engagement,” where teachers adjust instruction based on student input and capabilities (Black & Wiliam, 2018). For example, this involves gathering evidence of all students' understanding of the concept in class, rather than relying solely on those who are confident enough to share their views.

## 2.3. Flipped classrooms promote human independence, metacognition, and self-regulation

The pedagogical strategy actively promotes human agency and experience by rejecting the “banking concept of education” (McFarland, 2017), where knowledge is passively deposited. Instead, students are active participants, taking responsibility for their learning through team roles, decision-making, and presentations (Ramírez-Narváez et al., 2024). This creates problem-posing education, encouraging students to

critically reflect on positive change (McFarland, 2017). The course promotes the development of metacognition and self-regulation. Students are taught planning and self-monitoring through setting team roles and strategies, and self-evaluation through analyzing balanced scorecard results and engaging in structured reflection. The role of the educator is to gain evidence about the students' capabilities to mitigate the accountability trap with the flipped classroom model.

The requirement to articulate the logic behind decisions further enhances metacognitive awareness. While AI tools (like learning analytics from the simulator) can provide data for this, the ultimate interpretation and strategic planning for improvement remain with the human learner (Alam, 2021). By requiring students to engage with material independently before class and make complex decisions, the flipped classroom principles also implicitly encourage metacognitive skills and self-direction (Ramírez-Narváez et al., 2024). While a common challenge for flipped classrooms can be ensuring consistent student engagement with pre-class content, the immersive and competitive nature of the business simulator, coupled with the necessity for team decision-making and immediate feedback, inherently incentivizes this independent preparation. This structure transforms passive pre-class consumption into a direct prerequisite for effective active experimentation and reflective observation within the experiential learning cycle.

## 2.4. Integration with brain-based learning principles

The course's emphasis on active, engaging, and iterative learning also resonates strongly with brain-based learning pedagogical principles, which apply findings from cognitive neuroscience to educational practices (Arun & Singaravelu, 2018).

- Neuroplasticity and Growth Mindset: Carol S. Dweck's (2016) research on mindsets highlights brain neuroplasticity, emphasizing that the brain changes and strengthens with use. The continuous decision-making, feedback loops, and strategic adjustments within the simulator naturally promote this “brain as a muscle” concept.

The course design encourages a “growth mindset” where abilities are developed through effort rather than being fixed.

- **Engagement and Meaning:** Brain-based learning promotes student engagement, active involvement, and teaching meaning and understanding rather than memorization (Arun & Singaravelu, 2018). The immersive business simulator, the competitive element, and real-world connections through guest speakers create a highly engaging and meaningful learning environment. Winters (2001) and Caine & Caine (1991) underscore that learning engages the entire physiology and involves a search for meaning. The “emotionality of an experience influences retention” (Arun & Singaravelu, 2018), and the high-stakes decisions and pitches in the simulator would certainly trigger emotional responses, increasing retention.

**Cognitive Processes:** James Zull’s work, which directly parallels (Kolb, 2015) ELT with brain functioning, suggests that concrete experiences engage the sensory cortex; reflective observation involves the back integrative cortex; the creation of new abstract concepts occurs in the frontal integrative cortex; and active testing utilizes the motor brain (Ramírez-Narváez et al., 2024). So, the structured format of the reflection and simulation exercises would be consistent with using these various parts of the brain during the learning process.

### 2.5. Guiding AI integration and avoiding the “AI Trap”

The best practices example is designed to avoid the “AI trap” of outsourcing human thinking. This aligns perfectly with the comprehensive framework for AI’s influence on pedagogy, which centers on human-centered learning and a critical, values-driven integration of technology (Alam, 2021). The framework claims that AI should enhance, broaden, and genuinely improve education rather than directly substitute human teachers or human cognitive functions.

The business simulator, while a technological tool, is not presented as a replacement for human interaction or critical thought. Instead, it serves as a sophisticated

environment for active experimentation (Faria et al., 2009), allowing for the practice of complex skills in a controlled setting. According to Alam (2021), this is an example of exploring non-human AI-driven technologies for educational aims rather than replicating traditional human teaching techniques. As noted by this author, technology can help the teacher to focus on more meaningful interactions like coaching and complex feedback, rather than automating their professional judgment or pushing them to work “more like robots.” The simulator is used in class as an ongoing case study to assess students’ performance in leading a sustainable business venture. Every class has different dynamics and results, which makes it a powerful tool to mimic real-world situations and prepare students as future leaders.

The pedagogical strategy presented for teaching leadership and sustainability serves as an excellent model for modern education. It effectively uses the principles of experiential learning to promote deep understanding, critical thinking, and self-direction. Using brain-based learning principles, it reflects how the brain naturally learns by mixing active ‘doing’ with reflection using the business simulator. Moreover, its design integrates elements of the flipped classroom by providing students with theoretical knowledge prior to in-class application. This strategy integrates technology in a human-centered way, using the simulator to assist learning (Faria et al., 2009).

## 3. CONTEXT OF THE DESCRIBED PRACTICE

This section discusses the experiential learning in the Leadership and Sustainability course for bachelor students (about 20-25 students per cohort) at Universidad del Rosario (Del Rosario University), Bogota, Colombia. It teaches critical thinking and problem-solving using a business simulator.

The teaching approach is a fusion of experiential learning theory, brain-based learning principles, and flipped classroom elements, with the teacher acting as a coach. The human-centered combination promotes basic human capabilities, such as critical thinking,

self-direction, and problem-solving. In this AI world, students are being prepared for success by promoting personal development and focusing on purpose.

### **Part 1: Setting the stage and initial strategy (weeks 1-6)**

Students learn fundamental knowledge through readings and discussions, with teams presenting keynotes and facilitating Q&A via Slido. Using a tool like Slido allows all students to contribute to the discussion and show their level of understanding of the topic that they had to prepare before class. They complete a personality test and reflect on becoming sustainable leaders. Following the introduction to the “Conscious Capitalism carbon fiber bikes” business simulator, teams define roles and values using a Team Charter Canvas and then present an initial business plan. The first decision round involves gathering market data and making initial strategic choices regarding store location, production, and product design within a \$1.5 million budget.

### **Part 2: Operational decisions and initial feedback (weeks 7-10)**

In Decision Rounds 2 & 3, teams make operational decisions regarding compensation, marketing, production, and pricing, with an additional \$1 million investment. Following each round, teams privately present their decisions and underlying logic to the instructor, and receive individualized feedback and coaching based on simulation data. After Decision Round 3, teams review their results on a balanced scorecard, which assesses market share, reputation, and human resource management, reflecting teamwork and contributing to their grades.

### **Part 3: strategic expansion and final reflection (weeks 11-15)**

In Decision Round 4, teams pitch their business vision to a venture capitalist to raise an additional \$2.5 million, with pitch quality impacting their share price. Rounds 5 & 6 focus on strategic expansion, including international markets and R&D investments. In

the final round, teams present their final decisions and reflect on their learning journey using tools like the eco-cycle planning canvas and the ‘start, stop, continue’ framework. Using those frameworks enhances the learning experience by reflecting on their personal and group experiences. Throughout the course, industry leaders share their perspectives on leadership and sustainability-related topics to connect experiences with real-world examples.

*Materials Needed.* Key materials include the “Conscious Capitalism carbon fiber bikes” business simulator, academic articles, Slido, personality tests, the Team Charter Canvas, the balanced scorecard, the eco-cycle planning canvas, and the “start, stop, continue” framework.

*Instructor Preparation.* The instructor must become familiar with the business simulator and its coaching tips. This preparation involves organizing reading materials, managing digital tools such as Slido and personality tests, and preparing individual team presentations and feedback rubrics. It also includes understanding balanced scorecard metrics, inviting industry guest speakers, and developing facilitation skills to guide sessions using the Team Charter Canvas and the eco-cycling planning framework.

*Debriefing Exercise.* Debriefing is crucial for connecting experience to theory. This involves teams reflecting on balanced scorecard outcomes, discussing decision impacts on market share, reputation, and HR management, and reviewing teamwork dynamics. Students also reflect on their learning journey as future leaders using tools like the eco-cycle planning canvas and the ‘start, stop, continue’ framework. Finally, they connect experiential insights to course articles and theories, deepening conceptual understanding.

*Assessment and Reflection.* Student learning is assessed through quantitative and qualitative measures. Simulation performance, based on normalized balanced scorecard results, contributes to team grades. Individual assignments, including in-simulator micro-simulations, enhance specific knowledge. Quizzes and learning assessments assess understanding of business simulation concepts. Written reflections (personality test, eco-cycle, start-stop-continue) offer

insights into self-awareness and learning progression. For this case study, qualitative data from reflections and debriefing sessions were thematically analyzed to identify patterns in learning progression, and findings were triangulated across simulator performance, student presentations, and instructor observations to enhance validity. Presentations, including keynotes and the venture capitalist pitch, assess articulation and strategic thinking. Participation in Slido discussions and classroom contributions is also evaluated, with quiz and assessment scores often determining failure.

#### 4. DISCUSSION OF PEDAGOGICAL IMPACT

The pedagogical shift in the Leadership and Sustainability course addresses the crucial question of bringing humanity back into education amidst AI disruption, directly countering the “AI trap” of outsourced thinking. This is achieved through a fusion of experiential learning theory, brain-based learning principles, and flipped classroom elements, with the educator redefined as a coach of the learning process.

Central to this approach is the “Conscious Capitalism carbon fiber bikes” business simulator, which transforms learning into an immersive “learn-by-doing” experience. This real-world simulation environment allows students to practice Kolb’s ELT cycle, which promotes strategic decision-making, teamwork, and impact analysis abilities. Most are not fully developed using traditional teaching methods. The simulator’s competitive, challenging nature also uses brain-based learning principles, introducing tension and emotions that boost retention and promote a “growth mindset.”

On top of that, flipped classroom principles promote self-paced learning, with in-class time dedicated to interactive discussion rather than content delivery. This holistic model develops essential human capabilities, including critical thinking, self-direction, and problem-solving. Importantly, the simulator functions as a sophisticated instrument for active explorations, boosting learning without replacing basic human cognitive capabilities.

#### 5. CONCLUSION

In an era increasingly shaped by AI, the primary issue for education is how to reinforce essential human capabilities while effectively avoiding the “AI trap” of outsourced thinking. This study presents a unique pedagogical fusion of experiential learning, brain-based learning principles, and flipped classroom elements, where the educator is redefined as a coach.

Students actively develop strategic decision-making, resilience, critical thinking, and problem-solving skills through the simulator. These uniquely human skills are essential for success beyond AI automation.

This human-centered approach guarantees that technology, such as the simulator, promotes active experimentation without reducing core human cognitive and social functions. By going beyond traditional content delivery, we encourage self-creation, purpose-driven action, and metacognition, preparing students not just for automated tasks but also for dealing with complexity and creating new understanding. This model provides a strong answer to bringing humanity back into teaching, so education remains a truly social and transformative activity that develops unique human potential.

While this case study provides compelling insights, the findings are context-specific; future research should investigate similar pedagogies in a number of situations and using comparative techniques.

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