# Being the finger pointing to the moon: how martial arts can provide a holistic perspective on teachers' role in tackling sustainability challenges

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From social injustice to the climate crisis, our modern society currently faces an unprecedented magnitude of global challenges. To properly support future generations, long-term solutions must take into account the role of educational systems in developing necessary competencies needed for future world citizens. Pedagogical methodologies should reflect this need and adapt accordingly, focusing on developing intrapersonal and implementation capabilities that are acknowledged as sustainability-related competencies. While some educational approaches are better tuned to develop these skills, the deployment and effectiveness of these might be limited by the perception of the teacher's position in the classroom. Given the urgency of the situation, we propose to use educational principles that have already proved effective in developing similar skills for decades and centuries, and inspired by the world of martial arts. Rather than incorporating martial arts elements *per se*, we argue that by adopting key principles taken from traditional martial arts pedagogies, we can redefine the teacher's educational function, and by thus redefining the student's learning process to acquire sustainability competencies. We propose a conceptual framework that distills relevant elements from martial arts methodologies and defines ways to implement these in academic educational systems.

KEYWORDS

sustainability competencies, teacher education, martial arts, transformative education, transformative pedagogy

## Introduction

Next to the scientific, technological, and social advancements, our modern society is facing a fragile and critical phase of our social and natural systems, with social inequality, climate change, and biodiversity loss threatening the future of humankind (Rockström et al., 2009; Steffen et al., 2015; Kopnina, 2016). Parallel to any potential solutions related to human rights, restricted emissions, etc., our educational systems must reflect the urgency and magnitude of future challenges. The students of today, who are the social actors of tomorrow, must be guided to develop appropriate sustainability-related competencies to face these future challenges (Orme and Dooris, 2010; Bottery, 2016; Mense et al., 2018; Brundiers et al., 2021; Warrier et al., 2021).

Recognizing the importance of such measures, UNESCO has defined key sustainability competencies that need to be developed by educational programs (UNESCO, 2017). Systems-thinking, anticipatory, normative, strategic, and interpersonal competencies are widely accepted as required competencies. Most recently, it was suggested that both intrapersonal and implementation competencies are essential in developing integrated problem-solving capabilities (Brundiers et al., 2021; Redman and Wiek, 2021). While intrapersonal competency is related to the ability to reflect on one's role in the local community as well as in the global society, implementation competency refers to the capacity to translate these reflections into action. Both competencies are related in the sense that by identifying strengths, weaknesses, and opportunities for personal development through self-awareness, individuals can enhance their potential to implement sustainability initiatives. Furthermore, the process of aligning personal values with sustainability goals can strengthen one's sense of purpose and motivation, which, in turn, can aid in overcoming obstacles during the actual implementation of those goals.

Transformative learning pedagogies often aim at developing these skills and suggest holistic and in-depth learning approaches that confront students with the process of making sense of disorienting dilemmas in the form of sustainability challenges (Morin, 1992; Mezirow, 1997; Bell, 2016). By addressing real-world challenges, students' frames of reference are confronted, which prompts critical reflection and self-awareness. Of the pedagogical approaches tuned for sustainable education, problem- and project-based learning educational programs are widely used, focusing on group work and student-centered approaches (Brundiers and Wiek, 2013; Wiek and Kay, 2015). However, these approaches are the exception to the rule, and the development of sustainability competencies is still a marginal component of most programs (Rieckmann, 2012; Savage et al., 2015).

As the facilitator of any educational pedagogy, the position and function of the teacher are central to the success of the education process and should also be re-evaluated in light of the pedagogical considerations mentioned above. The need for a change is already evident, and a large study regarding the position of teachers points to a dramatic decline in teachers' status over recent years, mainly due to austerity measures imposed on national governments (Symeonidis, 2015). Other parameters should also be considered, such as the state of mind and expectations of today's students. In higher education, and especially in private institutes, education is perceived as a commodity, and the teacher as an individual providing a "service", instead of wisdom (Mintz, 2021). While developing students' intrapersonal and implementation competencies, the traditional academic concept of the teacher as a "content vessel" should change, and instead of directing the students toward a fixed, pre-defined goal, significant weight should be given to the process itself, prompting self-reflection and the development of an individual positionality that stimulates conscious action (Moore, 2005; Magro, 2015). The position of students as passive receivers of knowledge may also prevent them from developing initiative and intrinsic motivation (Cavanagh et al., 2017). On the other hand, a consumer orientation might prompt a judgmental and defensive mindset toward teachers, preventing students from engaging in the study experience. This

in turn could prevent the development of empathy and other competencies that promote collaboration for sustained action (Brown et al., 2019).

To encourage the shift to transformative education for sustainability, universities should support teachers in developing updated teaching competencies. Research has identified authenticity as a key competency for transformative teachers; however, the conditions in which teachers are allowed to be authentic are often lacking proper attention (Cranton and King, 2003; Brookfield, 2017; Tassone et al., 2017; Adomßent et al., 2019).

To answer the abovementioned challenges, we propose a potential framework to create a more interactive, collaborative, as well as experimental and practice-oriented pedagogy, inspired by traditional martial arts (MA) pedagogies and methodologies. This framework provides both context and tools for shaping the learning dynamics in a way that promotes the development of intrapersonal and implementation competencies.

Our proposal to draw inspiration from martial arts-related principles and methodologies relies on the fact that these methodologies are already utilized for decades and centuries for personal development purposes, and only need to be modified for academic education. Specifically, we propose the view of the traditional MA teacher as a model to the academic teacher. It is important to note that the traditional aspect of the so-called traditional MA is not necessarily related to the historical timeline of the art but to the pedagogical characteristics associated. While, for MA practitioners, this can be reflected in certain rituals, terminology, outfits, etc., we mostly focus on pedagogical concepts rather than external features. For example, in karate, a Chinese-inspired Okinawan-origin MA that was "Japanized" during the last century, which is practiced all over the world, practitioners are using typical Japanese terminology for the techniques, the teacher salutation (please see below), wearing karate-gi (a rather modern outfit introduced as a part of the modification of the Okinawan form of the art in Japan), and more. Rather than directly applying such specific martial art concepts, and although a growing body of research indeed suggests a beneficial effect of martial arts practice on both cognitive and affective behaviors (Vlachos, 2009; Origua Rios et al., 2018; Moore 2023, and more), we propose a different approach, one that takes advantage of the pedagogical methodologies and principles of martial arts practice without incorporating martial arts elements within the academic curriculum. Since these methodologies are designed to develop self-discipline, self-efficacy, mental resilience, and perseverance, we argue that these methodologies can be useful in developing intrapersonal and implementation competencies.

# Pedagogical framework, principles, and competencies

## Martial arts as a pedagogical approach

Given the global popularity and diversity of martial arts, it is important to first define the concept of MA in the context of the proposed framework. MA is a heterogenic collection of practices that have been developed and practiced all around the

world, and especially across East Asia, initially with a focus on physical preservation. While an overarching accepted definition is hard to be found, Green and Svinth nicely define these practices as "systems that blend the physical components of combat with strategy, philosophy, tradition, or other features, thereby distinguishing them from pure physical reaction" (Bowman et al., 2010). Nowadays, MA schools can be found all over the world, with high variability between purposes and styles, ranging from combative, sportive, and recreational practices. Here, we refer to the so-called traditional martial arts, where the pedagogical methodologies are both conserved and relatively consistent among schools. The traditional aspect of these arts heavily relies on the geographical, historical, and cultural context in which the art was created and developed. Importantly, most MA practices nowadays reflect a historical blend of different cultures, styles, personal interpretations, etc. Yet, we may distinguish traditional MA such as the Okinawan Karate, Japanese Iaido, Indian Kalaripayattu, different Chinese kung-fu styles, and others, from non-traditional MA, that, although not necessarily more modern, are generally more functional and lack the cultural character of the former. These include different kickboxing styles, self-defense systems (Russian Systema, Israeli Krav Maga, etc.), and others. While this distinction is far from being clear-cut, and the definition of "traditional martial art" represents a spectrum, rather than a clear distinct collection of arts, it is still useful as a pedagogic reference point. Despite the known variability between traditional MA styles and schools, several common core aspects can be found among traditional MA academies. For this discussion, we focus on three dimensions and propose a framework that adapts specific elements from MA pedagogies to academic education.

Most of the literature about MA pedagogy relates to the methodologies used to teach MA, and the application of these methodologies in non-MA academic education is rather novel. Instead of implementing MA elements as a part of the curriculum, we propose to define specific MA-related pedagogical principles which support transformative academic education in a non-MA environment. It is important to note that the proposed framework does not suggest adopting specific stereotypic features such as a designated uniform distinguishing teachers and students, ritualistic behaviors (bowing, for example), etc., but distilled concepts that can be universally applied, and some specific examples will be discussed in the following sections.

## Learning objectives; pedagogical format

We identify three potential MA-related domains that can serve as a model for MA-inspired academic pedagogies, namely the teacher's position, the pedagogical approach, and the environmental settings. For that purpose, we propose the following pedagogical transformations:

(1) The position of the teacher: a shift in power structures, from a lecturer to a MA-inspired teacher. The MA teacher differs in several ways from the current academic lecturer. An analysis of the terms used to describe the MA teacher already provides deep insights into the position of the teacher and

the type of relationships with the students. In Chinese, the term Sifu (or Shifu) is used to describe a teacher or a skilled and knowledgeable person. However, there are two distinct ways to write the word Sifu, one, 師傅, emphasizes the appreciation for the person's skills and experience, while the other which is the accepted term for a martial arts teacher, includes the character for "father", 師父, creating a special connection between the function of a father and a teacher. Another term that is used mostly in Japanese martial arts is Sensei, which is composed of two words, Sen–before and sei–life, and generally means "the one that was here before". The key message here is not just the knowledge, but the first-hand experience of the teacher in the subject at hand. In other arts, the word Guru is used, describing "one to be honored, teacher", although interestingly, literally means "heavy", to signify value. In all these examples, the teacher's authority is not granted by the possession of knowledge alone, but also by an appreciation for their real-life relevant experience, while realizing that they are too still on the learning path. As an ideal, the sensei/shifu is much more than a person who knows their system and is a role model and a shoulder to lean on. This empathic and humble, yet practical approach puts the teacher in what might seem like a contradictory position of being simultaneously compassionate and strict. This conundrum is solved when we think about shifting the focus from transmitting knowledge to guiding the different phases of the student's learning process; the teacher personally identifies with the current learning challenges (as "the one that has been there before"), while at the same time guiding the students toward a desired learning process which they are not yet familiar with.

To allow the above "long walk on the learning path", both teachers and academic institutes should change their perspectives regarding the teacher's role. From the teachers' perspective, it is imperative to be a "forever student", open, curious, and passionate about learning. In Japanese MA where the modern belt system is used, achieving a black belt is considered a great achievement that one may acquire after years of practice. But while it is indeed an important milestone, the first black belt level is called Shodan, which means "beginning degree". In Chinese culture, the term "Kung-fu" does not necessarily relate to MA, but any skill achieved through hard work and practice. We are encouraged to never stop sharpening our skills and acknowledge the fact that there is always more to learn. This attitude stimulates a growth mindset where setbacks and obstacles are taken as opportunities to learn and effort leads to mastery (Boyd, 2014). From the academic institutions' perspective, universities should allow the teacher to acknowledge the challenges and mistakes along the way, make sure teachers can effectively reflect on these, and see mistakes as an opportunity for learning (Leighton et al., 2018). Universities should make sure teachers have the time and space to keep themselves properly updated and encourage professional interdisciplinary debates, see the "bigger picture", identify potential pitfalls, and find ways to approach these in an authentic way. It is important to reflect

on this element as a part of the professional assessment of teachers.

From the student's perspective, the teacher's position and function should be aligned with the transformative educational approach. The traditional MA teacher is approached by the students with much respect, and the ability to learn from such an individual is perceived as a privilege. The teacher, and education in general, should not be perceived as a commodity students buy, but an opportunity earned by dedicated work. The positionality of teachers as guides, with an emphasis on "the one that has been there before", promotes connection and empathy, which in turn have been shown to stimulate moral reasoning for pro-environmental behavior (Berenguer, 2010). The result is that the students are more attentive and mindful of the learning materials and goals, and trust the teacher as a guide in the learning process. The autonomy and relatedness that are promoted by this approach can foster students' motivation and commitment which is likely to improve their achievements (Ryan and Powelson, 1991). The trust and connection with the teacher are particularly relevant in the context of sustainability education where sentiments such as eco-anxiety and eco-guilt, that halt student wellbeing and pro-environmental action, can arise as a result of environmental awareness (Stanley et al., 2021). By doing that, the teacher act as "the finger pointing to the moon", and the students are encouraged "not to focus on the finger, or they will miss all this heavenly glory".

(2) The pedagogical approach: a shift in the source of knowledge, from providing information to enabling experience. Instead of a unilateral delivery of information, the teacher's experience and knowledge are used for guiding the students and working with them, in a continuous process of co-creation. For the novice eye, the MA teacher does not provide answers, but questions that the student needs to explore. These might be seen as enigmatic, sometimes mystical aspects of the practice, where, for example, a certain movement seems to make no sense. However, the research process that the MA student embarks on is the actual goal, since the answer itself is not fixed, and is dependent on the student him/herself, the relevant circumstances, etc. The karate kata and the tai chi forms (as well as similar technical sequences in other arts) are interesting and relevant examples in this context. To transfer this concept to academic education, the learning process should allow students to gather knowledge and analyze it under the guidance of the teacher, in an interdisciplinary manner that properly represents the world's complexity in a comprehensive way. In turn, the assessment strategies should reflect this type of learning process, and instead of relying on memorizing facts should focus on assessing analytical skills as well the application of knowledge. By achieving that, we reassure the students that not succeeding is not perceived as a failure, but instead as a part of the learning process. It could be argued that this element plays an important role in the development of implementation competency since experimentation is considered a key driver of change in sustainability transitions and trial and error plays an important role in the development of

sustainable innovations (Sartorius, 2006; Sengers et al., 2019).

(3) The educational environment: a shift in the environmental interaction, from a classroom to a lab. There are several aspects related to the educational settings that should be considered, and here we highlight the physical settings and the atmosphere in the classroom.

(a) The atmosphere in the classroom: much like the current concept of the teacher as a provider of information, the education environment, the classroom, is an inert space, where students are expected to sit and listen. However, it has been shown that an active educational environment has many advantages, and has proven to contribute to the academic performance of students (Donnelly and Lambourne, 2011). Moreover, it is not only the ability of the students to move, but the movements of the teacher him/herself communicate important information and affect the learning process (Sullivan, 2018). MA practice is clearly an active and dynamic environment, in which both teacher and students use their senses to constantly exchange information. In MA settings, the teacher demonstrates a certain technique and then walks around the students while they practice it, paying personal attention to each student. It is a multi-layered interaction, in which teacher and students are continuously interacting, as individuals and as a group. In the context of education for sustainability, such multisensorial settings could be an inspiration to integrate contemplative exercises for inner development, such as mindfulness and deep listening, in the classroom (Wamsler, 2020).

The transformative classroom should allow physically dynamic interactions and be designed more as an exploration space, or a lab. In some academic settings, such modifications are already used, as illustrated in the small-scaled circular sitting arrangement in Problem-Based Learning or Teams-Based Learning settings (Lindblom-Ylänne et al., 2003; Savage et al., 2015). However, other ways of interacting with each other and with the world are even more dynamic and inclusive, such as in outdoor educational settings that is advocated for sustainability education. These could be inspired by the type of interactions that are observed in MA settings, being mindful while listening and cultivating movement and openness to interactions as a pre-requisite of fruitful collaboration for sustainable action (Cooper, 2010).

(b) The rules of the classroom: an important condition to allow a physically dynamic learning process is a safe and respectful educational environment. For that, proper ways of communication should be defined, with an open yet respectful approach. Clear boundaries are essential not only to establish respectful and safe interactions but also to allow free exploration by the students, without the fear of "going too far". Once the students acknowledge it, this type of respect toward the teacher and fellow students promotes a safe yet dynamic learning environment. MA usually involve fighting of

some sort (whether sportive sparring or self-defense techniques) for which the teacher must ensure the safety of all students, at all time. The possibility to practice such techniques is dependent on that safe background. As a result, any MA student knows that regardless of the technique practiced, the sparring partner, etc., at the end of the practice, everyone will shake hands and return home both physically and mentally safe. The importance of a safe educational environment was nicely reviewed by Singer-Brodowski et al. (2022). One essential first step in effectively designing a safe transformative academic environment is setting a proper mindset and attitude. A beautiful example of achieving that within the Japanese MA is the formulation of the "dojo kun". The dojo kun, which literally means "the rules of the house", is a concise list of defined ideals and moral behaviors that everyone in the dojo is expected to behave according to (dojo is translated to "the house of the way", which in itself carries an important meaning). While the dojo kun is formulated individually by each school, it is very common to find kindness, avoiding violence, commune responsibly, commitment, and honesty, for example. A co-creation of such "dojo kun" can not only significantly contribute to the development of ethical and moral behaviors but also increase the engagement and commitment of the students to the learning process.

Parallel to formulating the list, it is important to make clear the consequences of not adhering to it. Having such an agreed document, and making it visible, facilitates a better and long-term internalization of the desired education environment. It also triggers another core principle commonly emphasized in MA practice, which is self-discipline, where the students are clearly expected to personally monitor their conduct. Certain pedagogies that are commonly used in education for sustainability, such as problem-based project-oriented learning, include the definition of a contract at the beginning of the group project (Holgaard et al., 2017). However, such a contract includes mostly organizational and logistical aspects of the group work, instead of having a focus on desired behaviors and shared visions. In this context, the relevance of morality and life purpose for sustainable education has been recently proposed by Kuusisto et al. (2023).

## Discussion

It is clear that future world challenges cannot be answered by past world typical educational methodologies. Proper adaptations of our education systems are essential, and if education is to be transformative and truly contribute to tackling future societal challenges, it should aim to be integrative and holistic, shaping skills, mindset, and behaviors (Cranton and Roy, 2003). To achieve this pedagogical shift, teachers' function and position in the classroom should be re-evaluated and adapted to the new needs of their students. Currently, there is still a gap regarding the new role of teachers and teacher training, as well as the students' expectations

from the teacher and academic institutions in general (Larrivee, 2000; Laursen, 2005).

Traditional MA practice offers a unique combination of physical activity directed at self-protection, sports, and recreation, with philosophical, moral, scientific, and cultural content, all delivered in a unique pedagogical approach that has been shaped for decades and centuries. These methodologies, which are tuned for personal development and self-realization, highlight and develop vital intra- and interpersonal skills. The overlap between the skills developed by MA practice and the sustainability competencies needed to address the challenges that our world is facing makes the pedagogical approaches of traditional MA very relevant. Moreover, these are already well-developed and applied worldwide, making them an available model for academic pedagogical methodologies.

Even when taken outside the formal setting of MA practice, there is a growing acknowledgment of the benefits of MA programs in various academic settings (Sharma and Haider, 2015 and others; Ayvazo and Aljadeff-abergel, 2019; Giordano et al., 2021), and research points to a beneficial effect on both cognitive and affective function (Burke et al., 2007; Fabio and Towey, 2018 Harwood-Gross 2021), as well as academic achievement (Lakes and Hoyt, 2004; Pinto-Escalona et al., 2021). It is suggested that martial arts practice encourages individuals to seek self-improvement, enabling a sense of purpose and achievement (Krein, 2010). However, the vast majority of these works include the integration of MA elements into the educational environment, by adding karate, tai-chi, or other arts programs into the academic curriculum. Although we would wholeheartedly advocate incorporating MA practice in any academic setting for promoting both staff and students' wellbeing, we highlighted the pedagogical methodologies relevant to developing sustainability competencies. Moreover, by focusing on MA-inspired elements rather than MA practice *per se*, we do not need to mind potential negative aspects of certain MA practices, for example, injuries (Zetaruk et al., 2000; Noh et al., 2015; Farkash et al., 2017). Also, with this adaptive approach, we avoid potential cultural incompatibilities that might be present by adopting specific MA elements.

To our knowledge, the aim of the proposed framework to distill MA methodologies and incorporate these in a non-MA environment is a unique and novel approach, relevant to the development of approaches to enact sustainability competencies in the classroom through a guiding framework for teachers. Given the variability of MA systems and approaches, we focus on traditional martial arts and specifically define the relevant elements for developing sustainability competencies. We are aware that this perspective is not exhaustive and others may define these systems differently and identify different pedagogical elements (Mehrenberg, 2013). While this variability nicely reflects the breadth of MA approaches, we still advocate for the use of traditional MA to inspire sustainability-related pedagogies, since other approaches such as military or competitive MAs do not capture the collaborative essence of the approach that is necessary for sustainability transformations (Brundiers et al., 2021). As mentioned, MA can be found all around the world, reflecting different cultural and historical concepts, which can be used to promote cultural sensitivity and diversity in the classroom. While most of the examples we presented are taken from either Japanese

or Chinese MA, there are many other MA that advocate similar ideas, and further expand on these. This global nature of MA facilitates the transformation to sustainability-related education in different cultures. However, due to the popularity of some of the arts over others, we also recognize potential cultural compatibility issues, stemming from the fact most traditional MA are east-Asian in origin. While some elements are heavily dependent on cultural aspects (terminology used, outfit, etc.) and most likely need to be adapted to contemporary settings, the essence of the position and relationships between the teacher and students can be globally utilized. It is also important to recognize the constantly evolving nature of MA, and the large space given to personal, and sometimes political interpretations of MA. For this reason, we focus on defined MA-inspired concepts, rather than borrowing MA elements for specific arts.

We did our best to support the proposed framework with relevant and well-documented examples from a variety of MA, as well as non-MA scientific literature. Future research is needed to validate and further develop this approach, ideally in combination with other transformative educational pedagogies for sustainability.

In sum, drawing from MA pedagogy, we define three paradigm shifts to facilitate the transformation of the educational process toward sustainability:

(1) Shifting power structures: the teacher is a facilitator of the process, and the balance of achieving the learning goals shifts toward the students. The value of commune responsibility is critical, encouraging students to develop intrapersonal competencies, as well as the empowerment needed to implement sustainable interventions.

(2) Shifting the source of knowledge: the concept of the teacher as "the finger pointing to the moon". While there are different ways to interpret this phrase, we propose that the teacher should be perceived as a knowledgeable and experienced guide, and the moon here is the path or the learning process. The teacher's role is not to deliver information but to teach the students how to gather and analyze information, resulting in a continuous process of co-creation.

(3) Shifting the environmental interaction: the value of embodied learning methodologies is widely accepted, and several educational pedagogies are already adapting the class design and atmosphere accordingly (Thorburn, 2015). MA advocates the physical challenging of knowledge via direct experience, rather than detached theoretical information. Such a holistic learning process leads to a better internalization of knowledge via personal and commune experience, including the principles and practical implications of this knowledge.

Finally, our proposed MA-inspired framework positioned the teacher as "the one that has been there before" and focused on the teacher's knowledge and experience as an instrument, rather than the goal of the learning process. Specific skills such as active listening, empathy, gratitude, and mindfulness are tightly connected to this process and are inseparable from the way of the MA teacher. As a result, the perception of the MA teacher is filled with logos, ethos, and pathos, and it takes years of hard work and dedication to learn and imbed the concepts, morals, and skills needed to become a sensei or shifu. While most will not choose the path of the MA teacher, there is wisdom that can be borrowed and applied to other domains. By analyzing core MA pedagogical concepts, we can provide the transformative teacher with a framework to "fall back to" while supporting today's students in developing much-needed sustainability competencies.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

## Author contributions

AV and GS contributed to the conception of the proposed framework, with AV focusing on transformative and sustainable education and GS on martial arts pedagogy. AV and GS contributed to the drafting revision and approval of the submitted version. All authors contributed to the article and approved the submitted version.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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