

GARDEN OF PHILOSOPHY: A NATURE-ORIENTED IDEA OF UNIVERSITY, A CROSS-CULTURAL REVIEW

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ABSTRACT: This article explores the significance of gardens as landscapes for contemplation and education across various cultures, including Iran, Greece, Japan, and medieval Europe. Through a cross-cultural and historical analysis of existing literature, it examines examples of the interaction between philosophy and gardens, such as court gardens and cloister garths of madrasas and early universities, where the garden served as an active participant in the educational experience. Additionally, it investigates the influence of gardens on culture, literature, philosophy, and language, revealing how these spaces shaped modes of thought and reflection. The article argues that gardens were not merely physical environments but philosophical spaces rooted in the affinity between humans and nature, places where intellectual and spiritual growth took place. It also highlights their potential contribution to sustainable development goals in education and urban well-being. The study advocates recognising gardens as vital spaces for intellectual and spiritual growth in modern education. This knowledge could help develop landscapes fostering thinking and debate in schools and universities, where communication between students, thinkers, and scholars reflects the enduring legacy of gardens as sources of inspiration and creativity.

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INTRODUCTION

Gardens have long represented the cultivation of both nature and the self, a concept explored in literature and philosophy throughout history [1]. These spaces have served as environments for intellectual engagement, philosophical reflection, and cultural exchange, shaping the way societies think, learn, and grow. In 1625, Francis Bacon, a philosopher advocating for mastery over nature, referred to gardens as the "purest of human pleasures" and a "refreshment for the spirit" [2]. Like art, gardens are cultural expressions designed to enhance both human character and the environment. The relationship between gardens, philosophy, and intellectual reflection has played a crucial role in shaping each other's development over time [1].

Gardens are deeply rooted in the cultural and philosophical worldviews of the societies that created them. Persian gardens, for example, evoke an image of paradise, with the centre symbolising a cosmic focal point that connects the individual to the world's four corners and the realms beyond, where the finite and infinite, human and divine, Earth and Heaven converge [3]. Similarly, Zen gardens hold significant meaning in Japanese culture and spiritual thought. Gardens also appear prominently in literature and poetry, such as in the works of Persian poet Saadi, whose *Bustan* and *Gulistan* (The Orchard and The Rose Garden) are iconic texts. Furthermore, garden design has influenced

philosophical thought, as seen in Plato's Academy in ancient Athens, which was likened to a garden, or in Iran, where gardens and court gardens were seen as spaces for contemplation and meditation. As natural interfaces, gardens offer individuals a chance to reconnect with nature, providing respite from the chaos of urban life and fostering a deeper understanding of the environment [4]. This integration of green spaces and reflective environments into everyday life not only contributes to individual well-being but also enhances the quality of public spaces, fostering the creation of more sustainable and inclusive communities [5]. From their ancient origins to contemporary innovations, gardens continue to inspire individuals across cultures, standing as enduring symbols of humanity's profound connection to the natural world [6]. The role of gardens as spaces for reflection and metaphors for philosophical ideas underscores their significance across cultures and periods. Their presence within learning environments, whether historical madrasas or modern universities, reflects their potential to enrich educational experiences by cultivating spaces that support both critical thought and emotional balance. Today, modern learning environments, such as universities and schools, could benefit from incorporating the subtle, contemplative qualities of gardens to enrich their educational atmosphere. These gardens provide opportunities for social interaction, community engagement, and interdisciplinary learning.

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Furthermore, integrating community gardens into educational settings can offer students a holistic learning experience by exposing them to healthier behaviours, fostering a sense of connection to nature, and providing practical, hands-on opportunities [7]. As Karl Jaspers [8] emphasised, universities are communities where scholars and students engage in the pursuit of truth, not just places of instruction. Gardens, with their reflective atmosphere, can enhance communication between thinkers, fostering a deeper exchange of ideas. As Olivadese and Dindo [4] point out, gardens in modern urban life encourage a heightened awareness of one's surroundings, much as libraries inspire intellectual thought through books; gardens foster contemplation through nature [2]. By integrating gardens and natural landscapes in a new format into educational institutions and learning spaces, societies can take meaningful steps toward achieving United Nations sustainable development goals (SDGs) such as higher-quality education and more sustainable, inclusive urban communities [9]. This integration not only enhances students' cognitive and emotional well-being but also promotes environmental awareness and social cohesion within communities. For example, short-term contact with green spaces on university campuses has been shown to significantly enhance students' psychological well-being and reduce mental fatigue [10]. Additionally, inclusive green public spaces can serve as platforms for intercultural dialogue and community engagement, contributing to urban resilience and equity [9].

This study explores the relationship between nature, philosophical thought, and learning across various historical contexts, including Japan, Iran, ancient Greece, and medieval Europe. By examining how gardens functioned as spaces for contemplation and intellectual exchange, this research provides valuable insights for modern educational institutions. The research emphasizes the historical role of gardens as vital spaces for learning, education, discussion, reflection, and the cultivation of knowledge and building on this historical perspective, it aims to inform contemporary educational institutions on how integrating natural landscapes into university campuses can enhance the learning experience, merging historical wisdom with present-day academic needs and addressing the dual objectives of fostering intellectual growth and promoting well-being.

METHODOLOGY

This review aims to evaluate the role of gardens in spaces dedicated to learning, philosophy, education, and contemplation. It begins with a historical-analytical examination and a review of exemplary educational and contemplative landscapes in various civilisations. Representative examples from different

cultural and historical contexts are selected to illustrate the interaction between gardens and educational or philosophical practices. These include Plato's Academy in ancient Greece, madrasas and court gardens in Islamic civilisation (with a focus on Iran), Zen gardens in Japan, and cloister gardens in medieval Europe. Selection criteria include their documented historical association with educational and contemplative activities, the presence of designed landscapes intended to facilitate reflection and intellectual exchange, and the availability of credible historical records, scholarly studies, and visual documentation. Data are collected from primary historical sources, such as architectural records, drawings, and written descriptions, as well as from secondary academic literature, including peer-reviewed journal articles, books, and research reports. Visual materials, such as site plans, reconstructions, and photographs, are also reviewed to support spatial and design analysis. The characteristics of these spaces are explored in detail, and their spatial, symbolic, and functional aspects are analysed. The study also offers a theoretical discussion on the role of gardens within intellectual and contemplative environments. By establishing the historical and cross-cultural significance of gardens in fostering thought and reflection, it argues that these principles can be applied to the design of modern educational spaces, including universities and schools. This demonstrates how lessons from past landscapes can inform the creation of sustainable, intellectually enriching, and contemplative environments in contemporary educational settings.

The historical background and literature review

Gardens have long been a fundamental aspect of human civilisation, playing a significant role in both the collective imagination and the cultivation of thought. The practice of cultivating gardens dates back to early human societies, with gardening traditions shared across diverse cultures worldwide. Gardens are human-made enclosures dominated by plants and defined by physical or symbolic boundaries. The earliest known depiction (circa 3000 BCE) shows such a space. While often bordered by walls or fences, gardens remain open to air, weather, and living beings, allowing the natural movement of seeds, plants, and animals—some welcome, others not. They embody a balance between "enclosure and openness. Gardening reflects humanity's profound connection to the fundamental experience of life, or "lifeworld." Despite diverse garden styles and locations, it reveals our inability to fully "objectify" this lifeworld in its inexhaustible

entirety [2]. The writings of Plato and other Greek philosophers, combined with archaeological remains from antiquity, demonstrate a connection between gardens and other open public spaces. The gardens and court gardens played a significant role in the development of philosophy in the ancient world, and as Groening and Wolschke-Bulmahn [11] argue, the Greeks created the first gardens for schools and academics. Furthermore, the Athenian Agora was a centre where thinkers and philosophers gathered, and Socrates famously wandered the streets of Athens barefoot, asking questions [12]. In ancient Rome, environments such as forums, baths, and court gardens became hubs for discussion and thought exchange. Although the fall of Roman civilisation in the 5th century AD led to the decline of gardens and court gardens in Europe, the concept of court gardens and education both survived in monasteries and Christian churches. These monasteries preserved Greco-Roman and early Christian literary culture, serving as schools, self-sustaining communities, and production centres. By the 12th and 13th centuries, as society evolved, intellectual and religious life shifted to cities, spurring the rise of Europe's first modern universities [13].

Furthermore, the ancient Persian worldview and their approach to spatial planning are deeply interconnected with the nature and geographical conditions of their environment [3]. Throughout Iran, gardens with roses were built, called "pairidaeza," from which the English word "paradise" derives [11]. These gardens and court gardens, often built in arid landscapes, provided oases for reflection and meditation for thinkers, philosophers, and Sufis of the Islamic world. Furthermore, Madrasas, which were often inward-looking schools with court gardens at their centres, offered beautiful vistas from the students' rooms and a suitable space for the gathering of students and thinkers for learning, discussion, and exchange of ideas.

In East Asia, Zen gardens serve as spaces for deep contemplation, where natural elements reflect the impermanence of life, while their carefully cultivated forms symbolise the mind's constructiveness, creating a contrast that challenges the thinking mind. Beyond its surface beauty, the Zen garden invites a pause for reflection, guiding thoughts away from daily distractions and into a realm of profound introspection [14]. Applying Zen philosophical principles to the design of Zen-inspired landscapes, including temple gardens, was a crucial aspect of their creation [15], and a Zen garden was a place for reflection where the natural elements nourish the mind and body [16]. This approach to gardens and thinking, while different in many ways, underscores the importance of gardens in creating suitable spaces for meditation.

Studying these examples reveals that gardens were more than just physical spaces; they served as gathering places for philosophers and thinkers

throughout history, where they shared ideas, exchanged thoughts, and cultivated intellectual growth. While thinkers and philosophers have used other spaces throughout the ages, gardens are an essential environment for the cultivation of thought and gathering of thinkers. This hidden potential of gardens as a landscape for contemplation and argument could be further utilised in the modern era and in the future to provide suitable outdoor landscapes for thinkers and students worldwide.

The historical development of universities and institutions of higher education is a reflection of the evolution of thought, culture, and society. These institutions have long served as epicentres of knowledge and intellectual growth, contributing to the shaping of civilisations. Understanding their origins and functions offers valuable insights into how education has been intertwined with cultural practices, including the cultivation of gardens, symbols of contemplation, beauty, and harmony. This literature review will begin with the critical role that nature has played in the educational environments of various cultures, starting with the significant contributions of Persian gardens in Iran and the Islamic world, followed by Japan's unique relationship between gardens and learning. It will then delve into the philosophical foundations laid by ancient Greece and the subsequent developments in Europe. Additionally, an exploration of the history of universities will highlight their pivotal role in shaping modern society, and attention will be drawn to modern universities that emphasise the importance of nature and contemplation in their educational practices.

Iran

The examination of landscape and architecture in Iran reveals a profound connection between culture and nature, which culminates in the creation of gardens. When people first settled on the Iranian plateau in the fourth millennium BCE, agriculture became the driving force of civilisation and in a relatively arid climate, trees, plants, and water were essential for life. As society stabilised, gardens evolved not only as sources of sustenance but also as representations of spiritual beliefs, symbolising the perfection of the universe, abundance, leisure, power, and protection [17]. Gardens held immense cultural and social significance in Iran's hot, dry climate, and many of their features, such as ponds, fountains, flowers, trees, and their enclosed structures, became intertwined with cultural values. The term *pairidaeza* signified a garden in Achaemenid times (550–330 BCE) and later gave rise to the Greek term *paradeisos*, the Latin *paradisus*, the Arabic *firdaws*, the modern Persian *Pardīs*, as well as the terms *paradis* (French) and *paradise* (English).

The centre of the gardens was conceptualised as a cosmic centre, interconnected not only with the four corners of the world but also with the beyond, serving as a point where Earth and Heaven, the

human and the divine, the finite and the infinite converge [3]. The famous archetype of the Persian garden, the *charbagh* (four gardens), was closely associated with the image of paradise in religious and mystical texts [18], and the concept of the garden became a central cultural theme in Iran rather than a mere visual image [19]. Thus, Gardens became omnipresent symbols in Persian art, music, and literature, and wherever Persian art is found, traces of the garden are evident [20]. The influence of gardens on thinkers, mystics, and scholars of the time can also be found in famous works of literature. In poetry, for instance, the development of the garden as an expression of paradise resulted in a cultural synthesis, enabling thinkers and poets to refer to gardens literally and metaphorically [17]. The titles of Saadi's *Golestan* (The Rose Garden) and *Bustan* (The Orchard) both are references to the garden. The famous poet *Mulavī* (*Rūmī*) narrates the tale of an ant traversing the pages of a book, imagining itself in a rose garden, where words blossom like the flowers of this garden. This symbolism extends to the Persian language, where terms such as *chār-bahār* ("four-spring"; also, the name of a city in southeast Iran) and *hamīshe bahār* ("evergreen") symbolise the antithesis of destructive change and the anxiety produced by the unpredictability and impermanence of nature [19].

The earliest known gardens in the region were established in Mesopotamia. The Achaemenids (550–330 BCE) continued the tradition of garden-making, with *Pasargadae* (550 BCE) being the most notable example, which was created in an oasis surrounded by hills with a rectangular network of canals that formed a quadripartite layout, organising gardens, palaces, and pavilions [20]. The art of garden-making continued through the Parthian and Sassanid eras and during the reign of *Shapur*. The University of *Gundishapur* was established, where the favourable climate, fertile soil, abundant water, and the blend of Iranian and Roman influences created an ideal setting for discussions, teaching, and scholarly debates. This made it a suitable place for Greek and Roman philosophers and scholars, in addition to the learned individuals and intellectuals of Iran [21]. After the seventh century CE, large parts of the Sassanid and Byzantine empires were conquered by Muslim Arabs, leading to the spread of the Persian garden throughout the Islamic world [17], and the layout of Persian gardens influenced garden designs in other regions where Persian culture held sway [20]. During the Abbasid period, Islam experienced a renaissance in science, philosophy, literature, historiography, and religious studies as *Baghdad* and *Khorāsān* became centres where Greek philosophy, Gnostic mystical ideas, Indian medical science, and Persian governance converged [19].

In these vibrant environments, *madrasas* flourished as institutions for higher education. Evidence suggests that the "prehistory" of the

madrasa can be traced back to at least one and a half centuries before its official adoption by the Saljuq dynasty. These early *madrasas* were likely not substantial public buildings, and the foundations of this architectural typology should be understood within the context of a well-established tradition of building *madrasas* in the major cities of the eastern Iranian world and *Khorāsān*, such as *Nishapur*, where thirty-eight *madrasas* predate the renowned *Nizamiya* of that city [22]. Court gardens, which during this period were the central feature of most buildings, with all other spaces arranged around it [20], were adapted to *madrasa* design, and thus, the inward-looking garden became the primary structural element shaping the spatial organisation of these educational spaces. The importance of the *madrasa* as an educational institution, characterised by a courtyard adorned with trees and ponds, underscores the significance of gardens in designing spaces for contemplation and reflection [22] (Figures 1 & 2).

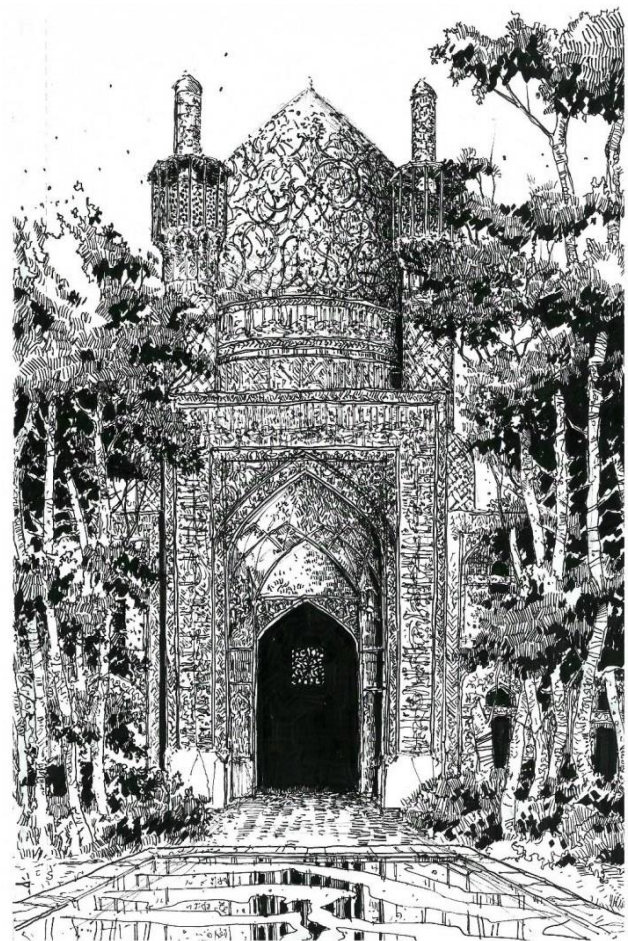


Figure 1. The view of the central court garden and main dome of the College of Mother of Shah Sultan Hussein, after passing through the entrance, provides a harmonious image between architecture and garden (Sketch by the Author)

During this period, Rabat Rashidi became a cultural and academic town where the greatest scholars of the era gathered from Eastern countries. It had a large library, and many plants were discovered and experimented upon in its gardens, leading to scientific discussions [23]. Rabat Rashidi exemplified the ideal of a harmonious society and became a significant centre for knowledge and culture during its time. Scholars and thinkers from

diverse backgrounds convened here, fostering a spirit of collaboration and intellectual exchange. The university town of Rabat Rashidi provided a serene backdrop for intellectual engagement and symbolised the harmony between nature and knowledge.

This integration fostered an environment for thought and creativity, creating a space where ideas could flourish [24, 25].

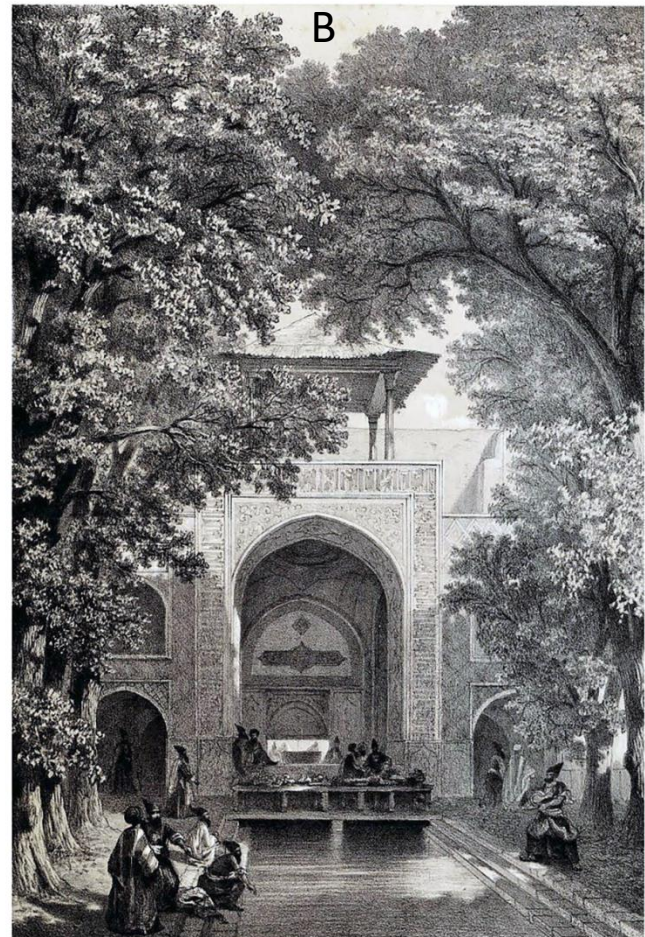
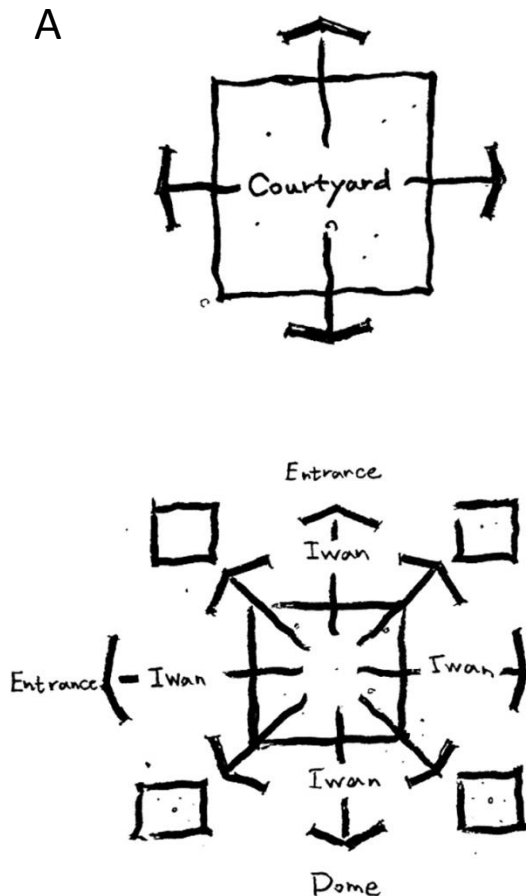


Figure 2. A) Placement of the courtyard at the heart of Madrasa not only provides access to the main areas of the school but also serves as the central hub for Engagement (Sketch by the Author) & B) Painting of the interior garden of the Mosque and College of Sultan Shah Hussein [26].

Japan

Japanese gardens hold a significant place in both individual and communal life, deeply intertwined with the culture, climate, and worldview of those who create them. To fully understand Japanese gardens, it is essential to first explore Zen philosophy. Zen is the discipline of enlightenment, which signifies emancipation. While freedom within the realm of relativity remains limited, absolute freedom is attained through enlightenment. Once this realisation occurs, external circumstances lose their hold, and one achieves inner liberation, a central tenet of Zen thought. Zen emphasises self-reliance and self-awareness, and peace, harmony, and beauty are the three fundamental elements that

characterise the art of the Japanese Zen Garden. These gardens cannot be categorised under a single typology as they encompass a variety of styles, each with its own distinct and unmistakable form. The goal is to offer the observer a reinterpreted vision of reality where every element contributes to an immersive landscape [16]. Through symbolic allusions, Japanese gardens engage the mind on multiple levels, fostering both conscious reflection and subconscious thought. Over centuries, the Japanese garden evolved to aid meditation practitioners in achieving a desired mental state, encouraging both conscious and subconscious thought. The meanings and narratives embedded within the garden's elements enhance the quality of

the space, inviting interpretation rather than imposing fixed ideas. The most essential principle in Japanese garden design is ensuring that the viewer's imagination remains unrestricted by a singular theme. The beauty of Japanese garden symbolism lies in its abstraction and flexibility, allowing these landscapes to be appreciated across cultures, nations, and generations. A single, carefully placed rock can symbolise an island in the Sea of Japan or evoke the grandeur of Yosemite Valley in California. This interpretive flexibility is one of the reasons Japanese gardens leave such a profound and lasting impression on all who experience them [27].

Unlike Chinese gardens, which are designed to be walked through and offer a variety of spatial experiences, Japanese gardens are primarily visual and intended to be admired from within the home. Thus, they become an intrinsic part of interior space and are conceived as an extension of it, an open, roofless environment that seamlessly integrates with the residence. Serving as a continuous point of interaction with nature, Japanese gardens also embody the spiritual world of Shinto, which is believed to be inhabited by numerous spirits. In contrast to Western gardens, which often symbolise human activity and reflect ideals such as humanism, individualism, or specific ethical principles, Japanese gardens represent the broader natural world [27]. Rather than showcasing human control over nature, they embody a holistic philosophy in which the garden serves as a microcosm of natural harmony.

Over centuries, Japan has developed a diverse range of garden styles, varying in size and form, including tea gardens, residential gardens, Zen gardens, and stroll gardens. Despite their differences, all Japanese gardens share a profound connection to architecture, history, nature, culture, and philosophy [27]. Zen gardens—also referred to as Japanese *karesansui*—have long been used as spaces for meditation and contemplation. Through the careful arrangement of rocks, meticulously raked sand and gravel, and other minimal elements, these gardens seek to capture the essence of nature in its purest and most harmonious form [16] (Figure 3). A key shift in Japanese garden design occurred after the Heian period with the rise of Zen monastery gardens during the Muromachi period. Known as *karesansui* or dry landscape gardens, these emphasised minimalism and the symbolic representation of nature. The decline of the aristocracy, the spread of Zen Buddhism, and the rise of the samurai led to significant social change. The idealism of the Heian period gave way to an era focused on meditation, where the samurai's quest for meaning mirrored their pursuit of power. Zen monasteries became centres of learning, culture, and commerce, reinforcing the samurai's intellectual and martial development. Zen Buddhism, emphasising personal effort and oral transmission over scripture study, aligned with the values of the emerging

warrior class [28]. Ashikaga Gakkō (足利学校, "Ashikaga School") is Japan's oldest standing academic building. Students from across the country were drawn to Ashikaga Gakko, where the curriculum centred on classical Chinese literature, Confucianism, *Laozi*, *Zhuangzi*, *Shiji*, *I Ching*, and Chinese medicine. Although the instructors were often Zen monks, the school primarily focused on Confucianism and secular education, with theological and Buddhist teachings explicitly excluded from the curriculum. Tuition was free, and students were expected to find accommodation at local private houses. The school featured a garden to grow its food and an herb garden to raise medicinal herbs, highlighting the significant role of nature in the learning environment [29].

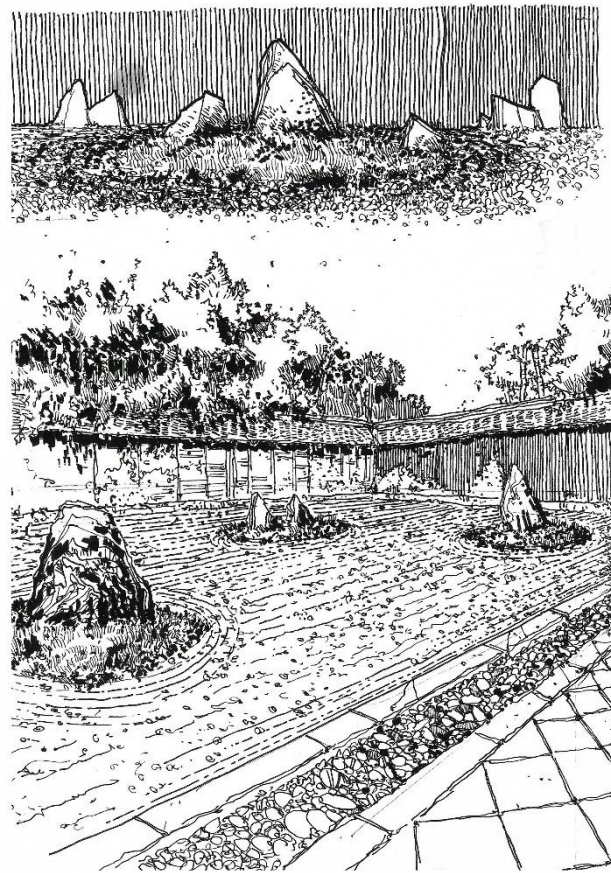


Figure 3. Tranquil and symbolic environment of Ryoan-ji Zen Garden, capturing the harmony of nature while allowing different interpretations of the landscapes by the viewer (Sketch by the Author)

The presence of these gardens not only provided practical resources but also served as an extension of the academic experience. The gardens offered students a tranquil environment for reflection and meditation, complementing their studies and encouraging a deeper connection to the philosophical teachings they engaged with. In a culture that values harmony with nature, the gardens at Ashikaga Gakkō facilitated a unique learning atmosphere where students could

contemplate the material learned in the classroom while immersed in the natural world.

Ancient Greece and Europe

The history of European academic institutions illustrates the pivotal role of gardens and gardening in spaces dedicated to thought and education. To understand this history, Plato's Academy must be examined first. Plato's Academy is considered the first institution of higher learning and stands as the most significant educational centre in ancient Athens. Philosophy, in its true sense, was established during Plato's time, and the Academy, where Plato and his students engaged in philosophical discussions within the Garden of Akademos, played a crucial role in this intellectual development [30]. All traditional academies of modern times trace their origins to the model of the *Academia Platonica*, which was established by Cosimo de' Medici in Florence in 1460, based on what he perceived to be the structure of Plato's Academy. The ancient Academy, on the outskirts of Athens, however, was not merely a school but resembled a public park or garden adorned with ancient trees. It was a sacred precinct dedicated to the Attic local divinity and hero, Akademos and the goddess Athena. Situated at the end of a ceremonial avenue and enclosed by a wall, it served as both a religious centre and a place for rest and recreation. Plato taught and lived in the

Academy from around 387 BCE, which indicates his residence in the vicinity of this holy precinct, specifically in a garden plot that included a house. He conducted his beginners' courses in the gymnasium located within the holy precinct, while more advanced discussions took place in his garden and the house located in his garden [31]. The Academy continued to operate during the Hellenistic period but was shut down for four years during the First Mithridatic War. In 86 BC, the Romans besieged Athens, causing significant destruction and plundering the Academy, making its reconstruction nearly impossible. When Antiochus of Ascalon returned to Athens from Alexandria, the Academy resumed operation, but at the Lyceum instead of its original location. Cicero recalls visiting the Academy one afternoon when it was "quiet and deserted at that time of day".

The Academy was finally closed in 529 AD by the Byzantine Emperor Justinian, after nearly 10 centuries of existence. Its legacy persisted in the following centuries, though it experienced periods of decline and renewal. According to Agathias, the remaining members of the Academy, including Siblikos, sought refuge in the courtyard of Khosrow I in Persia, bringing with them scrolls of literary, philosophical, and, to a lesser extent, scientific texts. Their safety was ensured with the Persian-Byzantine peace treaty in 532 [30].



Figure 4. The cloister at the centre of the Abbey of Santo Domingo de Silos, an example of the practice of garden making in the centres of learning throughout medieval Europe [32].

After the fall of the Roman Empire and the onset of the Middle Ages, monasteries in Europe became almost the sole repositories of what remained of the literary culture of the Greco-Roman world and early Christianity, becoming both schools and self-sufficient communities [13]. The art of garden-making also thrived in these abbeys [33] and thus Monasteries became crucial centres for spiritual and mental healing, shaped by religious practices [34] (Figure 4). Monastery gardens are frequently mentioned in early monastic records. St. Anthony, who organised the first monastic communities in the fourth century, cultivated a garden. Two centuries later, St. Benedict, founder of the Benedictine order, emphasised the importance of gardens in monastic life, stating that monasteries should include

essential features like a garden to prevent monks from leaving the enclosure, which he believed was harmful to their souls [35].

The earliest-known plans of monastery gardens are found in the St. Gall Plan, which includes several gardens vital to daily monastic life. These included the centrally located cloister garth, where monks could enjoy fresh air, the kitchen garden for vegetables and herbs, the infirmary garden for medicinal plants, and a cemetery garden with fruit and nut trees [36] (Figure 5). These gardens, often featured in medieval art and literature [35], had practical, religious, and cultural significance. Typically enclosed by walls or arcades, they were designed with symmetrical layouts, featuring quartered lawns and a central fountain [36].

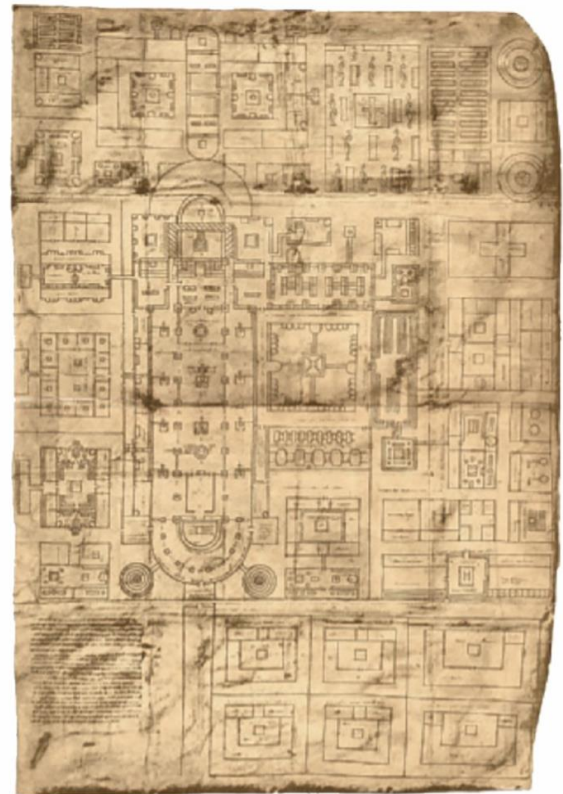
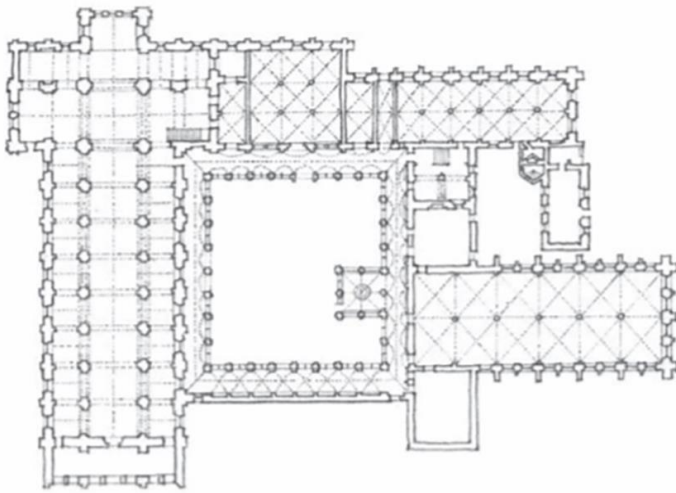


Figure 5. Plan of Fontenay Abbey showing a cloister at the centre of the complex [37], and a schematic plan of a 9th-century Saint Gall monastery, illustrating different spaces, including several types of gardens [13].

The influence of gardens in academic environments continued to evolve as European institutions of higher learning developed. The 12th and 13th centuries were a time of profound change in European society, and the focus of both intellectual and religious life shifted definitively from monasteries in the countryside to rapidly expanding cities. In these new urban centres, scholars founded the first modern universities [9]. Following the traditions set by monasteries and ancient academies, medieval universities in Europe embraced the idea of fostering spaces that

encouraged intellectual growth. Among the earliest and most influential institutions were the University of Bologna and the University of Paris, which are regarded as the first true models of modern universities in Europe and beyond. Founded in 1088 in the Italian city of Bologna, Bologna University is often celebrated as the oldest in the Western world [38]. Bologna also holds the distinction of being the first to employ the term *universitas* to describe the collective body of students and masters that constitutes a university.

The University of Paris, also known as "Sorbonne," is one of the oldest and most prestigious universities in the world. Founded in the thirteenth century, particularly in the year 1200, it is recognised as a centre of scholarly and educational excellence in Europe. It is also famous for its green spaces and gardens, such as the Paris Botanical Garden, which are used as places for contemplation and study. The Botanical Garden is one of the most well-known green spaces at the University of Paris, serving as an educational and research centre in the fields of biological sciences and botany. The University of Paris features various green spaces that act as tranquil and inspiring locations for study and reflection. These areas are typically located near educational buildings and libraries, allowing students to engage in learning in a natural and pleasant environment. Similarly, the University of Oxford, another historic institution, is celebrated for its stunning gardens that enhance the campus's aesthetic while serving as vital environments for learning and reflection. These gardens are strategically located near classrooms and libraries, providing an environment that encourages scholarly engagement [39].

Garden and the idea of modern universities

In Western philosophy, Plato saw the purpose of higher education as the "cultivation of the individual for the sake of the ideal society," where personal fulfilment would contribute to a harmonious society with citizens fulfilling their roles [40]. Centuries later, Jaspers [8] argued that the university's primary function is the search for truth, achieved through systematic research. Teaching, as the transmission of this truth, forms the second purpose of universities. Jaspers [8] also highlights the cultural role of universities in fostering intellectual growth and societal development. Universities and institutions of higher education play a pivotal role in shaping modern society. By educating the next generation of decision-makers, they exert a profound influence on the decisions that shape the future of communities [41]. Throughout history, universities have not only been centres of higher learning but also spaces where intellectual development and community life converge. Following this, the history of modern universities and the vital role that gardens and nature play in educational environments will be explored.

The development of universities from their medieval origins to the present day represents an

uninterrupted evolution, and one of the most significant achievements of the Middle Ages is considered the formal development of universities [42]. These institutions have grown from monasteries and schools to comprehensive hubs of research, science, and culture, influencing societies globally. The origin of universities, however, has long been debated. European scholars often point to medieval institutions such as the University of Bologna, established in 1088, and the University of Paris as the first models of modern universities. However, higher learning institutions existed long before Bologna in places like India, China, Africa, and the Middle East [43].

Though they may not have been called "universities" in the European sense due to linguistic and cultural differences, these institutions served a similar purpose, providing higher education and intellectual cultivation. For instance, as early as the 5th century BCE, centres of higher learning such as Thakshila in India functioned as international academic hubs [44]. In Southeast Asia, Egypt, and Turkey, educational institutions prepared young minds for civil service and societal roles [42]. In Iran, the Academy of Gondishapur, established between 246 and 287 CE, was one of the most prominent centres of learning in the ancient world, known for its advances in medicine, philosophy, and science. This institution attracted scholars from various parts of the world, particularly from Greece and India, and played a crucial role in preserving and expanding classical knowledge.

Universities in ancient and medieval times, whether in Europe, the Middle East, Africa, or Asia, interacted and influenced one another, ultimately shaping the European university model that later became the foundation for modern higher education worldwide [38]. Many of these institutions, along with the cultures that built them, were deeply connected to nature, often incorporating gardens as integral spaces for learning and reflection. This concept persists in some of the renowned modern institutions, where the presence of nature and gardens continues to play a significant role. For example, "The Green Heart" at the University of Birmingham, a leading institution in the marketisation of higher education in England, demonstrates this enduring connection. This expansive garden, surrounded by the university's most prominent new campus buildings, was designed as a multifunctional lounge area, conceptualised as a "social learning space" or "active learning space" [45]. The following table outlines the historical development of significant universities

around the world, from ancient learning centres to the medieval institutions that laid the foundation for modern higher education (Table 1).

Table 1. History of ancient universities.

Higher learning institution	Location	Date of foundation	Notable characteristics
Shanghai “Higher School”	China	2257-2208 BCE	One of the earliest recorded institutions of higher learning in ancient China
Imperial Central School	China	1046-249 BCE	Established during the Zhou dynasty, this school was pivotal in educating officials for the Chinese imperial system.
Takshashila University, Taxila	Pakistan	7th century BCE	One of the oldest universities in the world, offering subjects like medicine, law, and military science.
Nalanda University, Bihar	India	5th century BCE	A major centre of Buddhist learning and one of the earliest residential universities, drawing scholars worldwide.
Library of Alexandria	Egypt	285–246 BCE	Famed ancient research institution, housing vast collections of scrolls and attracting scholars from across the world.
Plato’s Academy	Greece	387 BCE	The first institution of higher learning in the Western world, founded by Plato, was centred on philosophy and dialogue.
Academy of Gundeshapur	Iran	242-272 AD	Renowned for its contributions to medicine, philosophy, and science, and a hub for scholars from diverse backgrounds.
Nanjing University	China	258 AD	One of China’s oldest universities was originally established as a Confucian academy.
Ez-Zitouna University	Tunisia	732 AD	One of the oldest Islamic universities, focusing on religious studies, law, and the Arabic language.
Baghdad School	Iraq	Early 9th century	Known as the centre of the "Golden Age of Islam," this institution contributed significantly to philosophy and science.
Ashikaga Gakkō (Ashikaga School)	Japan	839 or 842 AD	An influential centre of Confucian and military learning during Japan's medieval period.
University of Salerno	Italy	9th century AD	One of the earliest European medical schools, known for its advancements in medical knowledge.
University of Qarawiyīn (al-Karaouine)	Morocco (Fez)	859 AD	The oldest existing university in the world, with a focus on Islamic studies and jurisprudence.

Al-Azhar University	Cairo	970 AD	A key centre of Islamic learning, it continues to be one of the most prestigious Islamic universities in the world.
Temple of Literature	Hanoi, Vietnam	1076	Vietnam's first national university was dedicated to Confucian education and the civil service.
University of Bologna	Italy	1088	Considered the oldest university in the Western world, a model for modern higher education institutions.
University of Paris	France	1150	Known for its theology faculty, this university became a model for later European institutions.
University of Oxford	England	1167	One of the oldest universities in the English-speaking world, influential in various fields of learning.
Sankore University	Timbuktu, Mali	12th century	A centre of Islamic and scholarly learning in West Africa, contributing to the spread of knowledge in the region.
University of Cambridge	England	1209	Known for its research and intellectual rigour, it grew into one of the most prestigious universities globally.
University of Salamanca	Spain	1218	One of the oldest universities in Spain, known for its contributions to law and the humanities.
University of Montpellier	France	1220	Renowned for its medical school, it became a leading centre of learning in medieval Europe.
University of Padua	Italy	1222	Famous for its law and medical faculties, it attracted students from all over Europe.
University of Naples	Italy	1224	Founded by Emperor Frederick II, it was one of the first public universities in Europe.
University of Toulouse	France	1229	Known for its law and theology faculties, Toulouse became a significant educational centre in France.
University of Coimbra	Portugal	1290	One of the oldest universities in Portugal is recognised for its contributions to law and the humanities.
Universidad Complutense de Madrid	Spain	1293	One of Spain's premier universities, known for its academic excellence in various fields of study.
University of Lleida	Spain	1300	An influential centre for learning in Spain during the medieval period, particularly in the field of law.
University of Rome La Sapienza	Italy	1303	One of the oldest and largest universities in Europe, still a prominent institution today.
Rashidiyya Quarter (Rashid al-Din's Educational Complex)	Iran	1306	A major intellectual and cultural complex in medieval Iran, fostering scholarly exchange and research.

Source: Authors

CONCLUSION

While enclosed classrooms are ubiquitous in most universities, schools, and academies in contemporary conventional educational environments, a historical examination of the roots of education and educational institutions highlights the significance of gardens and open environments for thinking, learning, and intellectual discourse. From the inward-looking courtyards of Persian madrasas to the cloister garths of medieval European monasteries and the gardens of Plato's Academy in ancient Greece, gardens were far more than decorative or recreational spaces; they shaped the way thinkers and students engaged with knowledge, debate, and reflection. The central position of these gardens within educational institutions underscores their role in structuring the learning experience, providing an environment conducive to contemplation, dialogue, and intellectual exchange.

Examining the intrinsic relationship between the court garden and the madrasa shows that this central space was more than a mere open area; it played an active role in the education, debate, and daily life of students. Additionally, numerous references to gardens and gardening in Persian literature, intellectual discourse, and terminology emphasise this connection. A similar observation can be made in the English language, where words like "cultivation" simultaneously refer to both the preparation of land for agriculture and the development of skills or knowledge, reflecting the deep-rooted link between growth in nature and intellectual development.

In Iran, the integration of gardens into madrasas and educational complexes, such as Rabat Rashidi and the University of Gundishapur, facilitated not only meditation and reflection but also interdisciplinary discussions among scholars. Similarly, the Persian charbagh exemplifies how spatial arrangements and symbolic features created a microcosm of the universe, reinforcing a holistic understanding of the natural and metaphysical world. In Japan, Zen gardens functioned as structured landscapes for deep reflection, emphasising the cultivation of both mind and spirit. Likewise, ancient Greek philosophy flourished within gardens and court gardens, as well as in the agora and streets of Athens, where scholars engaged in discourse amid natural surroundings. These gardens and open environments were not merely tranquil retreats but active participants in the cultivation of thought, providing spaces where nature and intellect converged.

The analysis of these historical examples reveals a consistent principle: gardens serve as a bridge between nature and intellectual growth. In the modern era, recognising and harnessing the potential of gardens as spaces for intellectual and spiritual growth can foster creativity, reflection, and

scholarly engagement in educational institutions. By acknowledging the historical role that gardens have played in shaping human thought and learning, we can create spaces that not only nurture knowledge and wisdom but also foster engagement and ensure more equitable, inclusive educational experiences. For example, the University of Birmingham's "Green Heart" demonstrates how central gardens can operate as active learning spaces, supporting both social interaction and academic discourse. Beyond individual learning, contemporary green spaces promote social cohesion and sustainable urban practices. Drawing inspiration from cloisters and courtyards, green spaces can also reduce the ecological footprint of built environments while benefiting the local ecosystem, mitigating urban heat, improving air quality, and cultivating favourable microclimates. These benefits collectively support the achievement of several United Nations Sustainable Development Goals (SDGs), including quality education, sustainable cities and communities, and climate action.

Overall, the evidence across cultures and historical periods supports a clear conclusion: gardens have been, and can continue to be, essential catalysts for intellectual growth, reflection, and education. The enduring legacy of gardens as spaces for inspiration, learning, and intellectual engagement is undeniable. Their historical role in shaping learning environments offers valuable lessons for modern educational design. By appreciating their historical role in shaping philosophical and educational traditions, we can better integrate them into modern contexts. The future of learning and contemplation may well depend on a return to these lasting principles, where nature and philosophy converge to inspire the next generation of thinkers. Such integration ensures that the tradition of contemplative, intellectually rich spaces persists, bridging the wisdom of the past with the educational needs of the present and future, while simultaneously advancing principles of sustainable development.

DECLARATIONS

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Data availability

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

Authors' contribution

A.Ahmadimoghaddam contributed to the study conception, literature review, data collection, sketches preparation, and manuscript writing. S.Khaghani supervised the research and provided critical revisions.

Competing interests

The authors declare that there is no competing interest.

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