Cultural Studies of Science Education (2020) 15:157–168
https://doi.org/10.1007/s11422-019-09928-9

FORUM

Critical care of creationism

Steven Zhao[1] · David Chang[1] · Muga Miyakawa[1] · Heesoon Bai[1]

Received: 20 December 2018 / Accepted: 21 January 2019 / Published online: 26 June 2019

Abstract
In this response paper, we continue and further expand upon Elizabeth Watts' discussion on Buddhism and science, in the context of teachers' searching for the pedagogical "means to increasing student receptivity to science." While we share Watts' concern over the detrimental consequences of creationism in schools, we also offer an extended discussion on Watts' discourse on Buddhism and science, and the educational importance of care in the creationistic classroom. Namely, we argue that Watts' promotion of Buddhism as an exemplar for the compatibility between spirituality and science implicitly frames Buddhism as a religion that is *intrinsically* amenable to science. Such framing is both an insufficient presentation of Buddhism as a religion and, pedagogically, a less than optimal way to address and resolve the educational problems of creationism. We provide an extended discussion of Watts' discourse by elaborating upon Buddhism in its negotiative cultural, historical, and doctrinal situations. We argue that by situating Buddhism in such a situational context, Watts can lessen the risk of overshadowing the potential of creationist and Christian students in connecting with scientific values. In other words, it is to utilize Buddhism not as an enshrined distinction for its scientific amenability per se, but as a relatable possibility that can also be discovered, cultivated, and cared for in the particular faiths and identities of the students. Ultimately, our calling as educators is to walk with the students along the journey of curious and open inquiry while gently and skillfully holding their faithful commitments in the container of compassion and trust.

Keywords Science education · American Buddhism · Creationism · Evolution · Religion · Pedagogy · Mindfulness

Lead Editor: K. Tobin.

This commentary is a response to Elizabeth Watt's study entitled: In search of a better means of increasing student receptivity to science: a look at American Buddhists and their disproportionately high acceptance of the theory of evolution (https://doi.org/10.1007/s11422-018-9895-8).

✉ Heesoon Bai
Heesoon_Bai@sfu.ca

Extended author information available on the last page of the article

Executive summary

यह प्रतिक्रिया पत्र एलिज़ाबेथ वाट्स के बौध धर्म और विज्ञान की चर्चा को जारी रखने तथा आगे बढ़ाने के निरंतर प्रयास मे प्रस्तुत किया जा रहा है जिसका संदर्भ शिक्षकों की ऐसी शैक्षणिक खोज पर आधारित है जिससे छात्रों में विज्ञान के प्रति रूचि बढ़ाया जा सके । जब कि हम विद्यालयों में वाट्स की सृष्टिवाद के हानिकारक परिणामों पर चिंता को साझा करते हैं, हम बौध धर्म और विज्ञान पर वाट्स के विचारों को और सृजनशील कक्षा में देखभाल के शैक्षिक महत्व पर एक विस्तृत चर्चा भी प्रस्तुत करते हैं। अर्थात हम तर्क देते हैं कि विज्ञान और आध्यात्मिकता के बीच संगतता के प्रतिरूप वाट्स का बौध धर्म का प्रचार यह निःसंदेह दर्शाता हैं कि बौध धर्म आंतरिक रूप से विज्ञान के साथ अनुकूल हैं । इस प्रकार की योजना बौध धर्म की धार्मिकता तथा शैक्षणिक तौर पर सृष्टिवाद कक्षा की समस्याओं का समाधान इन दोनो ही मुद्दों का अपरिपूर्ण प्रदर्शन करती है । हम वाट्स के लेख पर विस्तृत चर्चा प्रदान कर रहे है जो बौध धर्म की बातचीतकारक सांस्कृतिक, ऐतिहासिक और सैद्धांतिक स्तिथियो के बारे में विस्तारित रूप से आधारित है । हम समझते हैं कि इस तरह के स्तिथिगत संदर्भ में बौध धर्म का उल्लेख करके वाट्स निर्मणवादी और ईसाई छात्रों को वैज्ञानिक मूल्यों से जुड़ने की क्षमताओं का निरीक्षण होने के जोखिम को कम कर सकती हैं। अर्थात, यह ना सिर्फ़ प्रतिष्ठापित भेद जो बौध धर्म को वास्तविक वैज्ञानिक उत्तरदायित्व प्रदान करे उस उपयोग के लिए है बल्कि छात्रों के धर्म एवं पहचान से संबंधित संभावनाओं की खोज, विकास और परवरिश के लिए भी है। अंततः, एक शिक्षक के पेशे से हमे अपने छात्रों के साथ उनकी जिगयासु एवं उन्मुक्त अनुसंधान की यात्रा मे उनके साथ चलना होगा साथ ही कोमलता और कुशलता से उनकी विश्वसनीय प्रतिबद्धता को सहानुभूति और विश्वास के पात्र मे अनुसरण करना होगा ।

Preamble

The co-authors of this response paper appreciate the thoughtful paper by Elizabeth Watts on American Buddhism and its embrace of evolution. As educators working in various stations in social and educational institutions, we share Watts' concern over the effects of creationism on teaching science in public school. Beyond its staunch denial of evolution, creationism in its dogmatic and ideological form corrodes trust in evidence and undermines the persuasive force of fact, which in turn diminishes our capacity to reach consensus on matters of political and social import. The organized effort on the part of creationist groups to influence public school curriculum, such as the revision of the Kansas' state curriculum in 2005 (Associated Press 2007), requires committed advocacy on the part of citizens who value science education. In concert with this effort, Watts has attempted to address the issue of creationism by emphasizing the American Buddhist discourse as a useful exemplar for the possible compatibility between spirituality and science.

We appreciate Watts' comparative inquiry upon the foundational principles of Buddhism and Christianity, insofar as their respective compatibilities with modern science are concerned; at the same time, we want to provide additional consideration to the immense scope of theological analysis that is required in mediating religion and science. Watts' essay reveals part of a larger whole constituted by social and historical realities and particularities—all of which inform the manifestation of a religion expressed by individuals and groups in a particular time and place. In this paper, we refer to Pali texts as well as teachings from other Buddhist sects to contextualize the generalizations that Watts attributes to Buddhism at large.

In her paper, Watts appears to suggest that Buddhism, or some element intrinsic to Buddhism, may remove some barriers for creationist students to consider alternative understandings of reality. While this may be a reasonable conclusion, it is not entirely tenable. Although Buddhism or Buddhist-style spirituality may potentially afford the integration between spirituality and science, it may not be the neutral panacea that she appears to

suggest it is. Our response in this paper addresses two fundamental aspects of Watts' thesis. First, we elaborate on the relationship between American Buddhism and the scientific epistemology by surveying the doctrinal, cultural, and historical context of their interactions. We agree in principle that Buddhism, guided by a fundamental trust in independent investigation, is hospitable to a spirit of inquiry that eschews the bonds of orthodoxy. At the same time, the manner in which Buddhism is perceived and transmitted is also facilitated by cultural and philosophical influences; thus, we cannot say that all Buddhists support science by virtue of their religious commitment. Although Watts has aptly captured and presented American Buddhism, we suggest an extended discussion on the "American" dimension of Western Buddhism, while considering the tenets of Buddhist teaching. We feel that Watts may have over-generalized the characteristics of American Buddhism and perhaps overplayed the doctrinal discourses of early Buddhist texts in ways that may be detrimental to her own position. We argue that by recognizing the negotiative contexts that situate Buddhism, teachers can recognize the capacity of religions—including Christianity—to integrate a scientific worldview. We believe that the students' Christian faith does not have to be perceived as an obstruction for science education. Faith, in our view, is not necessarily an obstacle to science literacy. We forward this discussion in the spirit of solidarity while supporting Watts' committed mission.

The second part of our response focuses on the elaboration of pedagogy that would be helpful in working with creationist students in a science class. This pedagogical move of ours is made possible by Watts' own distinction she makes between creationism as a *movement* and the *creationist student* in the classroom—while the former spurs debate about epistemology and ideology, the latter calls for pedagogical sensitivity and care. The pedagogical attempt to soften adherence to dogma does not have to take the form of mindfulness practices. Instead, we advocate for a mindful and empathic attention to students' attitudes toward their own religions. We wish to ease students toward a free inquiry while holding their existing religious commitments with care and openness.

Reconsidering Buddhism and science

In her paper, Watts presents research by the Pew Institute, which paints a stark contrast between American Buddhists' and American Evangelicals' views on evolution.

Watts notes that American Buddhists are "able to incorporate scientific data into their worldview while maintaining their spiritual beliefs and pursuits". Watts ascribes this acceptance of science among Buddhists to the teachings of respected figures, such as the Dalai Lama, and the inherent tenor of Buddhist faith, which favors investigation over dogma.

Our concern, however, is that, by ascribing Buddhism's amenability to science to its religious authorities and doctrines, Watts also risks implicitly framing the acceptance of science to be an intrinsic dimension of Buddhism itself. This becomes problematic insofar as rendering the discourse of Buddhism as a dichotomized phenomenon constituted by a neat division between its intrinsic core and extrinsic influences. In this dichotomy, Buddhism's amenability to science is informed by things that are *intrinsic* to its doctrine on the one side that can be suppressed by *extrinsic* cultural forces on the other. For instance, Watts writes: "It would of course be wrong to claim that Buddhism is immune to fundamentalist thinking, as every belief system has the potential of being misused by individuals…and its totalitarian ideology". In this description, Buddhism's amenability to science is framed to

be intrinsic to its doctrine, and that this intrinsic nature can be corrupted by the external forces of fundamentalist ideologies.

In this sense, what is intrinsic to the doctrine becomes captured and communicated as the "essence of Buddhism" that can be grasped as a stand-alone entity and that this essence has always been amenable to scientific inquiry. Ultimately, we argue that (1) this dichotomy is both insufficient as a presentation of Buddhist discourse and (2) that this insufficiency can potentially work against Watts' commitment to resolving the problems of the creationistic classroom.

In Watts' discourse, the effectiveness of her position appears to largely rely on the effectiveness of this dichotomy between the intrinsic and extrinsic elements of Buddhism. Amenability to science is framed as a philosophical attitude that is fundamentally *intrinsic* to the Buddhist doctrine itself, specifically upheld by its inherent values of opposing dogmatic clinginess. This can be observed in Watts' discourse as she largely emphasizes the Buddhist scriptural level of analysis as a way to demonstrate its amenability to science and anti-dogmatic nature. For example, Watts distinguishes Buddhism from Christianity and Islam on the level of scriptures as the religion that promotes "anti-authoritarian, anti-dogmatic approach to understanding one's self and the world in which we live". By largely focusing upon the level of scriptural comparison, Watts also then implicitly frames the amenability to science to be intrinsic to the Buddhist doctrine itself.

However, the intrinsic attribution of amenability to science seems to contradict the degree to which Buddhist practices and doctrinal presentations widely vary within different cultural and regional spaces. If it is within the Buddhist doctrine to be against dogmatism and clinging to views, then how does one account for the pervasive enmeshment with supernaturalism of most other Buddhist traditions? Does the American/Western exemption from such orientation only emerge as a peculiar idiosyncrasy? Granted, Watts acknowledges this issue by admitting to the fact that it "would be wrong to claim that Buddhism is immune to fundamentalist thinking". Yet the fact of such variability warrants an extended discussion on the *negotiative nature* between the Buddhist doctrine and its surrounding cultural situations, such that this dichotomy can then be rendered as *insufficient* in the first place. That is, Buddhism's amenability to science is not necessarily intrinsic to its doctrine as much as a negotiated outcome between doctrine and surrounding cultural contexts. Our discussion will be first anchored by an affirmation of Watts' emphasis on Buddhism's amenability to science. Therefore, our hope is not to deny the reality of such amenability, but to situate its discourse within a broader context that is in support of Watts' intention.

The making of a scientifically compatible Buddhism

The acceptance of science on the part of American Buddhists can be traced in part to the teachings of the Buddha himself. In the last year of his life, the Buddha uttered instructions that are still revered by many Buddhists today: "Each of you should make himself his *island*, himself and no other his refuge [emphasis mine]" (*Dīgha-Nikāya,* 16). "Island" is hereby translated from the Pali word, *dīpa*, from which the Sanskrit derivative (*dīvpa*) is sometimes translated as "light" or "lamp" (Carus 1915, p. 173). No English cognate denotes both *island* and *lamp* and saves perhaps *lighthouse* as our closest approximation; however, we can infer from the Buddha's exhortation an emphasis on self-reliance. An island, by virtue of its geographic isolation, symbolizes independence and autonomy. Likewise, a lamp can be seen as an island of light in a sea of darkness, a source of illumination

and revelation. By enjoining self-reliance, the Buddha affirms his followers' inherent wisdom. True understanding is not to be found outside one's own person, but rather through careful investigation of the nature of one's own mind.

This pronouncement would have significant implications for adherents of the Buddha's teachings. By affirming his followers' innate wisdom, did the Buddha not undermine his own authority as a teacher? For in encouraging disciples to be the final arbiters of their own path, must he not also admit the possibility of their rejecting his teachings altogether? Yet the Buddha's own past as a spiritual seeker, from pampered prince to ashen ascetic, exemplify a spirit of independent investigation that would not yield ultimate authority to an external sage. This does not mean that Buddhists must adhere to obstinate self-reliance and refuse wise counsel when they appear; rather, one is to never relinquish autonomy to an external orthodoxy, the Buddha's included. Thus, the injunction for disciples to be islands and lamps unto themselves must include the possibility of modifying, if not rejecting, Buddhist teachings. Watts' comments on Buddhist epistemology, and its abiding suspicion against orthodoxy, are accurate and astute. This fundamental disposition, at least in the West, has resulted in a religious movement that welcomes scientific investigation.

Despite Buddhism's apparent affinity with science, it nevertheless does constitute a doctrine laden with ideas that can challenge its intrinsic exemplary status for supporting scientific values. Although Watts brings in scriptural support for the fact of Buddhism's amenability to science, such as her emphasis on the Kalama Sutta in its promotion for independent inquiry, the Kalama Sutta is, nevertheless, one among many other Suttas. We note that Watts' usage of the Kalama Sutta for her position is helpful. However, she may have missed its underlying narrative intention of legitimizing and overcoming skeptical doubt (Pali: *vicikicchā*). According to Bhikkhu Bodhi (2010), the Kalama Sutta's promotion of independent inquiry is contextually intended to appeal to the Kalama's doubts by appealing to the immediately verifiable truths and ideas (e.g., independent inquiry and anti-authority) in order to circumvent their resistance to developing a *deeper faith* for the Triple Gem (Buddha, Sangha, Dhamma). It is, in a way, to help potential followers to ease into a sense of confidence for the immediately verifiable aspects of the Dhamma so as to provide the foundation of trust for the non-verifiable truths of the Triple Gem. Bhikkhu Bodhi (2010) writes: "This increased confidence in the teaching brings along a deepened faith in the Buddha as teacher, and thus disposes one to accept on trust those principles he enunciates…even when they lie beyond one's own capacity for verification" (para. 11). Therefore, although the Kalama Sutta (among others) may appear to promote values of independent inquiry, it is nevertheless narratively and contextually situated within fundamental notions of kamma, rebirth, and Nibbana (realities that are beyond one's capacity for immediate verification) as well as overcoming the doubt of their reality.

There are also various other Suttas that can seemingly oppose this very promotion of independent inquiry in *the manners that support science.* Buddhism's apparent amenability to science, therefore, is not necessarily the intrinsic condition of the Suttas as much as the culturally informed situation of scriptural selectivity in which such amenability becomes discursively expressed. That is, the fact of its amenability to science is not entirely intrinsic to its doctrine but is also dependent upon a particular framing of its doctrine in ways that accommodate a modernist discourse.

Broadly speaking, Buddhism is compatible with science in its *American and Western iterations.* It is useful, therefore, to expand upon Watts' discussion of the doctrinal, cultural, and historical situation of Buddhism, which, we believe, would help to support her position regarding the problem of creationism in education. For many Buddhists, commitment to investigation and cultivation of ethics and wisdom is nestled alongside a belief in

rebirth, and the different realms of existence in which rebirth takes place. This is exemplified in the Pali Canon where the Buddha is describing the consequences of unethical behaviors to be mostly defined by a rebirth in either a lower realm of existence or a poorer life in the same realm:

> Monks, the taking of life—when indulged in, developed, and pursued—is something that leads to hell, leads to rebirth as a common animal, leads to the realm of the hungry shades. The slightest of all the results coming from the taking of life is that, when one becomes a human being, it leads to a short life span. (Vipaka Sutta, Trans Thanissaro Bhikkhu 2013)

Additionally, one of the main hindrances to right view is described as "skeptical doubt" (Pali: vicikicchā), where one has an *obstructive* skepticism of the Four Noble Truths. The noble truths are themselves rooted in the notion of rebirths. For instance, the Buddha explains one of the noble truths in Dhammacakkappavattana Sutta as the painful and dissatisfactory nature of our existence, and frames their nature to persist rebirth:

> The Noble Truth of the Origin (cause) of Suffering is this: It is this craving (thirst) w*hich produces re-becoming (rebirth) accompanied by passionate greed*, and finding fresh delight now here, and now there, namely craving for sense pleasure, craving for existence and craving for non-existence (self-annihilation). (Dhammacakkappavattana Sutta, Trans Piyadassi Thera 2013)

Although Buddhism promotes the ideal of independent investigation, its instructive seriousness is nevertheless urged by the soteriological pursuit for liberation out of the cycle of rebirth. We read in the Pali Canon both an affirmation of free inquiry and an injunction to commit to the tenets of the Buddhist teaching. These two directives need not contravene one another: one can abide by a set of guiding principles while remaining open to other possibilities, without relinquishing authority to any religious doctrine.

What is intrinsic to the Buddhist doctrine, therefore, lies within a soteriological system of pragmatism and cosmology that can both *affirm and reject* the values of scientific inquiry and reason. The degree to which its doctrine is emphasized in its affirmation or rejection, however, depends upon the negotiative cultural and historical interactions within which Buddhism is situated. In terms of North American Buddhism, it is reasonable to say that its emphasis on the affirmation of scientific reason was largely facilitated by two forces: (1) the radical laicization of meditation that downplayed soteriology, where meditation became increasingly popular among the lay communities that were not necessarily committed to the salvific enterprise of Buddhism and (2) the continuous reinforcement of Buddhism as part of modernism through the scientific discourse from Asian, European, and American proponents.

The popularization of meditation distanced Buddhist practices from soteriological goals, thereby allowing a doctrinal openness to science without being obstructed by a supernatural baggage. Prior to the emergence and dissemination of contemporary discussions of mindfulness, meditative practices were largely the domain of monastics. Such esoteric practices were largely inaccessible to the laity as the soteriology of Nibbana required lengthy meditative and ethical commitments that extended to even multiple lifetimes.

However, such burden of monasticism was radically reduced by Mahāsi Sayadaw (1904–1982), a Burmese Theravāda monk, who essentially altered the discourse of meditation in ways that universalized the interest in meditation for the laity. This was done by emphasizing the *awareness* (Pali: *sati*) component of meditation while downplaying the foundation of concentration/absorption (Pali: *samādhi*). Such reframed emphasis massively

reduced the required soteriological length of commitment. Mahāsi reframed the arduous path into an immediate possibility: "It will not take long…but possibly in a month, or 20 days, or 15 days, or on rare occasion even 7 days for a selected few" (1971, p. 70). Through his influence, Buddhist meditation was mostly framed as an awareness practice for the sake of cultivating *independent investigative understanding* of one's experiences and reality. The emphasis of *sati* emerged as the "vipassana" movement. This framed meditation in ways that would then become discursively compatible with the scientific "eye" of rational and empirical inquiry and understanding.

In addition to the laicization of meditation in the form of *sati*, Buddhism was continuously communicated as a scientifically compatible discourse by both Western and Asian proponents. This discourse was one that emerged long before the "start" of American Buddhism and was arguably nested within its own cultural and political agendas. In a sense, a very specific version of Buddhism was continuously promoted for centuries that strategically downplayed the doctrinal components that were incongruous with the scientifically inclined culture of Europe and North America.

To name a few examples, individuals such as Anagarika Dharmapala (1864–1933), Paul Carus (1852–1919), and Jon Kabat-Zinn contributed to the flowering of a scientific Buddhist discourse that continues to reign as a dominant element in Buddhist modernism. The magnitude of their influence can be largely attributed to their framing of Buddhism in societies that espouse a scientific worldview.

The examination of meditation through a scientific paradigm started as early as the 1800s, with Anagarika Dharmapala appropriately performing what Seager (1995) refers to as a "strategic occidentalism" (p. 113). Namely, it was an attempt to reframe Buddhism as a scientifically informed philosophy for the sake of appealing to the Victorian liberal orientation. In his presentation in New York, he capitalized on the Victorian religious skepticism as well as scientific inclinations for the simultaneous promotion of Buddhism and attack on Christianity:

> In Christian countries scientists are at work to elevate the masses by scientific methods, while the missionaries that go to Asia are utterly deficient in scientific knowledge, … The message of the Buddha that I bring to you is free from theology, priestcraft, rituals, ceremonies, dogmas, heavens, hells and other theological shibboleths. The Buddha taught to the civilized Aryans of India twenty-five centuries ago a scientific religion containing the highest individualistic altruistic ethics… (Dharmapala 1991, pp. 77–78)

One of the main figures on the other side of this cultural exchange is Paul Carus, whose own personal crisis of faith aptly captured the creeping malaise of Enlightenment's disenchanting and paralyzing skepticism. The preservation of the spirit of religious meaning and faith for Carus was to be found in Buddhism's seemingly empiricist leanings, which serves as a useful example of how religious meaning can retain its significance by revealing some perennial expression (McMahan 2008). For Carus, by framing Buddhism as inherently scientific and by apposing Christianity and Buddhism, both religions can then be understood as manifestations of a timeless philosophy akin to the scientific truths of the world. This discourse is elaborated by Carus (1894):

> Buddhism is a religion which knows of no supernatural revelation, and proclaims doctrines that require no other argument than "come and see"…Thus, we trust that a comparison of Christianity with Buddhism will be a great help to distinguish in both religions the essential from the accidental, the eternal from the transient, the truth from allegory in which it has found its symbolic expression. (p. viii)

In more recent times, Jon Kabat-Zinn, through his promotive efforts of his Mindfulness-Based Stress Reduction (MBSR) program, has further reinforced the scientific investigation of Buddhism by subjecting meditation under the scrutiny of scientific research. As such, the validity of Buddhist discourse is subject to a scientific epistemology. In an interview by Thrive Global (Baer 2017), Kabat-Zinn aptly captures the relationship between Buddhist mindfulness and science:

> [M]indfulness would have a tremendous impact if the science said that it had been clinically successful at the medical center where I was starting MBSR. Then, because of its impact on mainstream medicine and neuroscience and health care, it would move out into society." (para. 4)

Mindfulness, in this scientific and medical context, does not demand the kinds of *beliefs* that have traditionally been part of a Buddhist faith. Rather, the fact of one's belief and commitment becomes increasingly contingent upon the scientific validity of meditative practices. One inclines toward Buddhist ideas and practices, not because of Buddhism itself, but only insofar as it is scientifically valid.

Additionally, the popularization of meditative practice coincided with growing discontent with the institutional church. Monotheism itself had suffered a devastating blow after the conflagration of two world wars. In the ashes of the Holocaust, belief in an omnipotent and benevolent deity could no longer be taken for granted. A wave of Buddhist teachers from Japan, Sri Lanka, and Tibet in the sixties and seventies helped establish centers of practice throughout North America. Western practitioners tended to be educated, counter-cultural seekers who were disillusioned by monotheist hegemony and curious about eastern philosophy. Scientifically minded but spiritually inclined, they found refuge in a tradition that would nourish both inclinations. American Buddhism's openness to science, therefore, can also be partly attributed to self-selection: those who gravitate to Buddhism tend to be those who already hold a naturalistic view of the world, who see no ostensible conflict between spirituality and science.

Through the simultaneous cultural and historical foundations of mass laicization and promotion of the scientific discourse, what resulted was a renovated Buddhism capable of facilitating rational and scientifically inclined adherents in the West. Buddhism, as previously stated, is not fixed, but nor is it entirely fluid. What it does constitute is rather the outcome of the negotiative interactions with cultures and histories. Buddhism *can be* opposed to, in support of, or indifferent to the values of scientific inquiry and reason, depending upon the pragmatic outcome of the attributed meaning of Buddhism in its situated culture. What Watts' presentation illuminates, therefore, is not necessarily an amenability to science that is fundamental to the Buddhist doctrine so much as the development of Buddhism in a Western context.

Extending amenability to science to other religions

Our attempt here, to situate Buddhism within its cultural and historical context, reveals an underlying commonality among religions in their capacity to accommodate scientific views. This recognition of commonality could provide an educational and intellectual space that affirms the existing religious commitments on the part of students. By exploring how religions are hospitable to scientific inquiry, not only in Buddhism, but also in Christianity, teachers offer a transitional space in which students can construct a bridge between religion and

science. If we understand American Buddhism as a unique adaptation of a Western mindset within Buddhist tradition, we see that streams of Christianity have accommodated scientific views as well. This is not to say that all Christian denominations share the same openness to science as American Buddhism. However, it is to acknowledge that a religion that accepts the weight of evidence points to the possibility of a Christian faith that marches alongside science.

By framing amenability to science as something that is intrinsic to the Buddhist doctrine, amenability to science then risks appearing as exclusively a Buddhist phenomenon. Buddhism, then, does not reveal the fortunate compatibility between science and spirituality, except in the case of Buddhism. Moreover, if Buddhism is hospitable to science and Christianity is historically and doctrinally distinct from Buddhism, then Creationism's perceived disconnect from science is both a problem that is intrinsic to the Christian doctrine, as well as, therefore, irresolvable through it. Watts' discourse of Buddhism may then exacerbate the problematic distance between Creationism and science that she adamantly attends to in the first place. Buddhism, regardless of its validity of exemplifying amenability to science, may stay at an unbridgeable distance from the students and their Creationistic discourse in the very fact of its enshrined distinction.

If we examine Buddhist teachings within its historical and cultural contexts, the same can be applied to the religions to which the students are committed. Buddhism need not occupy an exemplary status as a faith that facilitates science. If we look at Christian theology in both its doctrinal and historical–cultural conditions, we see that a fundamentalist creationist ideology is a specific development within the North American Evangelical Church, not an attribute of Christianity in general.

Possibilities within the Christian tradition

In her analysis of various religious views on science, Watts notes a difference between Catholic Christians and Evangelical Christians. Thirty-one percentage of Catholic adherents accepted evolution, compared to 11% of Evangelicals. Why are Catholics more open to evolution compared to evangelicals? Watts mentions papal pronouncements that affirm the science of evolution. The spectrum of biblical interpretations yields dramatic differences among Christians on the matter of evolution. Data from the Pew Research Center support at least this conclusion: adherence to Christian faith does not preclude support for evolution.

Just as Buddhism has updated itself with the shifting mores of culture and the demands of every era, Christianity itself continues to reinvent itself. Many theologians read the creation story as an allegory of divine involvement in the physical world. Unlike literalists who cleave to the account of cosmic birth in 6 days, these theologians, such as Elizabeth Johnson (2014), Thomas Berry, Brian Swimme and Mary Evelyn Tucker (Swimme and Berry 1994; Swimme and Tucker 2014), have no scruples against the scientific view of evolution. The trouble lies not in scripture, but in the interpretation of scripture. Text is mute in the absence of a reader (Ricœur 1991). On this point, Watts argues that the opening verses of a religious scripture reveal much about a particular religion. She juxtaposes verses from the King James Bible and the Qu'ran with passages from the *Dhammapada*, arguing that the latter emphasizes one's own mind independent of "the whims of an overseeing God". Here, Watts might be over-simplifying Christian scripture in the same way that she over-estimates support for science in Buddhist scriptures. In light of the wide array of interpretations within scriptural exegesis, we can say that textual evocations of God do not *necessarily* enjoin deference to an external authority on the part of believers, nor do they preclude non-literal readings of scripture. The creationist challenge to science curriculum is more a

statement on the Evangelical church as a sociopolitical force than a statement on Christianity itself. The challenge for believers (and for critics of fundamentalist forces within religion) is to make room for a multiplicity of readings, especially those that are hospitable to science. Many Christians can attest to the harmony between faith and science: for them, an unshakable spiritual core need not be threatened by facts; they can acknowledge the weight of evidence and yet retain a steadfast religious commitment. A myth, in this sense, does not refer to fiction; rather, as Tom Harpur points out: "A myth is what never was but always is" (Harpur 2005). If we want to assure creationist students that science does not require them to abandon their moral and spiritual commitments, thinkers and movements within the Christian tradition may serve as fine exemplars.

As Watts points out, the differences among religions are the result of a complex mix of historical, cultural, and organizational variables. Hence, an intransigent creationist ideology is likely the result of a retrograde reading of scripture that reflects a socialization that totalizes the thoughts of its adherents, while denying the merits of alternative views. Thus, creationism often comes with an antipathy toward other perspectives, Buddhism included. Guarded against the doctrines of other faiths, a creationist student is unlikely to find assurance in Buddhists who manage to join faith with science. Following along the trajectory of Watts' argument, we suggest looking within Christian traditions for examples of faith in step with science, but even there, we have no guarantee that creationists within the Evangelical Church will look favorably upon scientific views of other Christians.

Back to the rough ground, walking with creationist students

We stand with Watts in her educational endeavor and value her efforts in helping students address the creationist agenda. We note, however, that even mindfulness in its secular form may trigger resistance from creationist students. Resistant to views outside a given orthodoxy, students may bar any formative influence on their minds.

In the end, the essential task for science educators working with creationist students is not so much winning them over to evolution per se—which itself constitutes another kind of evangelical effort—but helping them develop an *open attitude* toward evidence, cultivating a curiosity that compels inquiry, and a willingness to recognize the veracity of fact even at the risk of overturning previous assumptions. These are educational objectives proper to the work of educators. Development of critical mindedness that questions the social establishment, the examination of unconscious racism, and the human-centric biases that wreak ecological havoc: these are educational aims and objectives worthy of democratic societies that are committed to justice and equality. In all these cases, educators encourage students to interrogate the world, which in turn shakes the foundation of what they hold to be certain.

We see in Watts' paper evidence of a pedagogical attitude that aims to help the creationist student. We support her position by emphasizing that educators must be *for* the students. The moment educators see the creationist students as outsiders to our educational aims and objectives; we inevitably approach and treat them as alterities, whose otherness must be expunged through an act of conversion. However, to see the student as an "other" that we need to convert is pedagogically unsound. Psychologically speaking, such perception and stance promote a sense of alienation for the other whom we set in opposition: a more helpful approach is to stand alongside the students, walk the path with them, sharing their fears and hopes, joy, and pain. It is through such sharing that students will come to develop and trust their own inquisitive capacity within a supportive community. Fear divides and attacks; love unites and attends.

Even in posing difficult challenges that push their thinking, teachers can convey care and regard for their students—in this way, a creationist student does not stand on the other side of an ideological divide, she is already a member of a shared community, tacking a course with the winds of learning. Without such care and regards, even well-intended and pedagogically sound challenges we pose to our students for their growth will likely be received as threats to their self-identity and existential security. First, there have to be love, care, respect, kindness and compassion in the hearts of the educators for their students before any learning, especially difficult and challenging learning, can take place in the students. And this would be the most difficult learning for any educator, and indeed, for all human beings.

When children repeatedly experience fear at the hands of caregivers, including educators, it is difficult for them to become open-minded, exploratory, experimental, and adventurous, in the domain of learning that can potentially disrupt their nascent understanding. If their physical or emotional survival is at risk with respect to learning, it makes sense that they would want to avoid such learning at all costs. The psyche of creationists, we surmise, is deeply influenced by fear of the concept of evolution. But we cannot ease such fear by trying to rationally convince our Creationist students to change their minds about the validity of evolution. Our very pedagogic act of trying to convince will only further stimulate their survival and existential distress.

Our calling as educators is to walk *with* the students and be there *for* them. In practice, this may mean careful case studies of how species change throughout time, how selective pressures, both natural and artificial, have influenced phenotypes. By shaping lessons and units in the form of open inquiry, educators can encourage students to ask questions while allowing them to come to their own conclusions. This, we believe, is a powerful form of science education, for students are charged with the questions that Darwin posed for himself as he studied wildlife on the Galapagos Islands. Throughout the inquiry process, educators can encourage students to gather evidence and interpret the significance of data. In essence, teachers do not *teach* evolution per se, but rather open avenues so that students *become* scientists by asking questions and looking for evidence. There is, of course, no guarantee that students will subscribe to evolution as an outcome of inquiry—but the investigation itself orients the teacher alongside the student and assumes trust in the inquisitive nature of the students. Difficult choices may be required now and then; teachers should be compassionate in holding the distress that a student experiences when learning ruptures an existing worldview. The most crucial work we do as educators is that we accompany them in their life journey of faith, however rough the ground is and however twisted the path may be. This is a difficult art.

Acknowledgements The authors thank Monica Bhattacharjee, PhD candidate in the Faculty of Education at Simon Fraser University, for her skillful translation of Executive Summary in Hindi.

References

Associated Press. (2007, May 25). *Evolution of Kansas science standards continues as Darwin's theories regain prominence—International Herald Tribune*. Retrieved 7 October 2018, from https://web.archive.org/web/20070525044215/http://www.iht.com/articles/ap/2007/02/13/america/NA-GEN-US-Kansas-Evolution-History.php.

Baer, D. (2017, April 12). *The father of mindfulness on what mindfulness has become: An interview with Jon Kabat-Zinn, creator of mindfulness-based stress reduction.* Thrive Global. Retrieved from https://medium.com/thrive-global/the-father-of-mindfulness-on-what-mindfulnesshas-become-ad649c8340cf.

Bodhi, B. (2010, June 5). *A look at the Kalama Sutta.* Access to Insight, Retrieved from http://www.accesstoinsight.org/lib/authors/bodhi/bps-essay_09.html.
Carus, P. (1894). *The gospel of Buddha according to old records*. Chicago: The Open court publishing company.
Carus, P. (1915). *The Gospel of Buddha*. Chicago: Open Court Publishing Company.
Dharmapala, A. (1991). Message of the Buddha. In W. R. T. Tripitakavagisvaracarya, W. M. Thera, D. K. Barua, S. B. Barua, U. Rupasinghe, T. B. Dissanayake (Eds.), *The Maha Bodhi centenary volume, 1891–1991* (pp. 76–83). Calcutta: Maha Bodhi Society of India.
Harpur, T. (2005). *The Pagan Christ: Recovering the lost light* (1st ed.). Markham, ON: Thomas Allen Publishers.
Johnson, E. A. (2014). *Ask the Beasts: Darwin and the God of Love*. London: Bloomsbury Academic.
Mahāsi, S. & Pe Thin, U. (Trans.) (1971). *The Satipatthana meditation.* San Francisco: Unity Press.
McMahan, D. L. (2008). *The making of Buddhist modernism*. Oxford: Oxford University Press.
Piyadassi, T. (2013, November 30). *Dhammacakkappavattana Sutta: Setting in motion the wheel of truth.* Access to Insight. Retrieved from http://www.accesstoinsight.org/tipitaka/sn/sn56/sn56.011.piya.html.
Ricœur, P. (1991). *From text to action/Paul Ricoeur* (*Kathleen Blamey and John B. Thompson* Trans.). Evanston, IL: North Western University Press.
Seager, R. H. (1995). *The world's parliament of religions: The East/West encounter, Chicago, 1893*. Bloomington: Indiana University Press.
Swimme, B., & Berry, T. (1994). *The universe story: From the Primordial Flaring Forth to the Ecozoic Era—A Celebration of the Unfol* (Reprint edition). San Francisco, CA: HarperOne.
Swimme, B. T., & Tucker, M. E. (2014). *Journey of the Universe* (Reprint edition). New Haven: Yale University Press.
Thanissaro, B. (2013, November 30). *Vipaka Sutta: Results.* Access to insight. Retrieved from http://www.accesstoinsight.org/tipitaka/an/an08/an08.040.than.html.

Steven Zhao is a doctoral student in the Faculty of Education, Simon Fraser University, Canada. He is currently interested in existential phenomenology, phenomenological psychology, Buddhist philosophy, and contemplative education.

David Chang is a teacher educator and PhD candidate from Simon Fraser University. He studies contemplative education, environmental education, and ecological ethics.

Muga Miyakawa is a doctoral student in the Faculty of Education, Simon Fraser University, Canada. He is interested in philosophy of education, ethics, and critical theory.

Heesoon Bai is a professor of educational philosophy in the Faculty of Education, Simon Fraser University, Canada. Her current research interests include contemplative inquiry in education, consciousness studies, psychotherapeutic dimensions of education, and ethics.

Affiliations

Steven Zhao[1] · David Chang[1] · Muga Miyakawa[1] · Heesoon Bai[1]

Steven Zhao
Steven_Zhao@sfu.ca

David Chang
David_Chang@sfu.ca

Muga Miyakawa
Muga_Miyakawa@sfu.ca

[1] Faculty of Education, Simon Fraser University, 8888 University Drive, Burnaby, BC, Canada