CJLT RCAT
Canadian Journal of Learning and Technology
La Revue canadienne de l'apprentissage et de la technologie

Volume 47 (2) Summer / printemps 2021

Attentional Literacy as a New Literacy: Helping Students Deal with Digital Disarray

La littératie attentionnelle comme nouvelle littératie : aider les élèves à faire face au désarroi numérique

***Mark Pegrum**, The University of Western Australia*
***Agnieszka Palalas**, Athabasca University*

Abstract

When students learn online, they do so within a wider context of digital disarray, marked by distraction, disorder, and disconnection, which research shows to be far from conducive to effective learning. Specific educational issues include a lack of focus, linked to information overload in an environment characterized by misinformation and disinformation, as well as a lack of connection to the self and others. Arguing that today's growing focus on digital literacies in education already serves as a partial response to digital disarray, this evidence-based position paper proposes the concept of *attentional literacy* as a macroliteracy which interweaves elements of now established literacies with the emerging educational discourse of mindfulness. Through attentional literacy, students may gain awareness of how to focus their attention intentionally on the self, relationships with others, and the informational environment, resulting in a more considered approach to learning coupled with an appreciation of multiple shifting perspectives. Armed with this developing skillset, students stand to benefit more fully from digital educational experiences. Considerations for continuing research in this area include the need to adopt a critical stance on mindfulness, and the need to operationalize attentional literacy for the classroom.

Keywords: attentional literacy; mindfulness; digital literacies; digital disarray

Résumé

Lorsque les élèves apprennent en ligne, ils le font dans un contexte plus large de désordre numérique, marqué par la distraction, le désordre et la déconnexion, dont la recherche montre qu'il est loin d'être propice à un apprentissage efficace. Les problèmes éducatifs spécifiques comprennent un manque de concentration, lié à une surcharge d'informations dans un environnement caractérisé par la mésinformation et la désinformation, ainsi qu'un manque de connexion avec soi-même et les autres. Partant du principe que l'importance croissante accordée aujourd'hui aux littératies numériques dans l'éducation constitue déjà une réponse partielle au désordre numérique, ce document de positionnement fondé sur des données propose le concept de littératie attentionnelle en tant que macrolittératie qui entrelace des éléments de littératies désormais établies avec le discours

éducatif émergent de la pleine conscience. Grâce à la littératie attentionnelle, les élèves peuvent prendre conscience de la façon de concentrer leur attention intentionnellement sur eux-mêmes, sur les relations avec les autres et sur l'environnement informationnel, ce qui se traduit par une approche plus réfléchie de l'apprentissage, associée à une appréciation des multiples perspectives changeantes. Équipés de cet ensemble de compétences en développement, les étudiants sont en mesure de tirer un meilleur parti des expériences éducatives numériques. Parmi les considérations relatives à la poursuite des recherches dans ce domaine, il y a la nécessité d'adopter une position critique sur la pleine conscience et la nécessité de rendre opérationnelle la littératie attentionnelle pour la salle de classe.

Mots-clés : littératie attentionnelle ; pleine conscience ; littératies numériques ; désordre numérique

Digital Disarray Outside Education

The COVID-19 "infodemic", so named by the World Health Organization (WHO, 2020), is the latest global information event to shine a light on the issue of *digital disarray,* comprising three principal interlinked components.

Digital distraction refers to a lack of focus caused by information overload in today's attention economy (Palalas, 2018; Pegrum, 2019b), with our devices having extended our attentional choices beyond our attentional capacity (Levy, 2016), and with technology companies' algorithms constantly seeking to ensnare our attention (Berthon & Pitt, 2019). Our distraction is compounded by the "headline stress" (Stosny, 2017) derived from the unrelenting stream of alarming news that flows via mass media, social media, and messaging channels onto our ubiquitous mobile devices. The result is fragmented attention and chronic stress, linked to a range of physical and mental health issues (Dobelli, 2020).

Digital disorder, a term derived from the Council of Europe's work on "information disorder" and "information pollution" (Wardle & Derakhshan, 2017), refers to the circulation of misinformation, disinformation and "fake news", a term chosen as the word of the year by the Macquarie Dictionary and the Collins Dictionary in 2016 and 2017 respectively. Confronted with a bewildering mixture of "hoaxes, conspiracy theories, honest misunderstandings and politicized scientific debates" (Wong, 2020), audiences cannot, or will not, disentangle fact from fiction due to a lack of time, expertise, or inclination – indeed, a certain "reality apathy" has set in (Ovadya & Bienstock, 2018). The acceptance or rejection of given information – on polarizing topics such as climate change, vaccines, and the coronavirus – has become dangerously tribal (Beck, 2017; Harford, 2017). In the COVID-19 era, the costs of this digital disorder are mounting; they include deaths from delayed medical treatment, self-poisoning from false cures, and vandalism of 5G towers (Spring, 2020).

Digital disconnection refers to the inability or unwillingness to engage effectively or constructively with difference, stemming partly from a lack of awareness of oneself and the parameters of one's own worldview. It is manifested in recent political and social backlashes against globalization and superdiversity (Creese & Blackledge, 2018; Vertovec, 2007), whether in the form of physical and digital mobility of unwelcome people, or predominantly digital flows of unwelcome perspectives (Pegrum, 2019b). The ensuing retreat into disengaged stereotyping has provided the

backdrop to verbal and physical attacks on the Chinese in Asia, Asians in much of the rest of the world, and foreigners, especially Africans, in China, as tracked by the media (List of incidents, 2020). Meanwhile, global political collaboration on COVID-19 has been hesitant; if, as Harari (as cited in Lew, 2020) has suggested, the antidote to epidemics is "information and cooperation" – and if the same is true of infodemics – then there is much work to be done in education.

Digital Disarray Inside Education

Education itself has been directly impacted by COVID-19, with the global rush to remote delivery fast-forwarding a longstanding gradual shift towards online learning as an alternative or complement to face-to-face, in-person learning. Consequently, a number of pre-existing challenges in online education, stemming from *digital disarray,* have become more widespread. Moreover, "emergency remote teaching", which occurs when offline courses are hastily shifted online in a crisis (Hodges et al., 2020), frequently with little guidance or reflection, is plagued with such challenges to a far greater extent than the more carefully designed online teaching of past years. While the current paper focuses on learners, it is clear that helping learners inevitably requires helping teachers too (cf. Hadar et al., 2020).

There is thus an enduring, but now more pressing, need to address *digital distraction,* given the impact of "continuous partial attention" (Stone, 2009) in education and other areas of life. The same technologies that create new options for learning can simultaneously distract from learning, which depends on concentration, engagement, and reflection over time (Palalas, 2018, 2019b). Ever more studies warn of the distracting effects of screens, especially mobile screens, coupled with social media and broader Internet access in learning and other contexts (Darghan Felisoni & Strommer Godoi, 2018; Ward et al., 2017; Whelan et al., 2020). The specific instantiations of digital distraction include media multitasking, which is not only cognitively inefficient and ineffective (Palalas, 2018; Wallace, 2006) but may be correlated with depression and anxiety (Page, 2019). Such multitasking can shade into addictive behaviors, which are educationally problematic and again may be correlated with depression, anxiety, and other mental health issues, along with reduced empathy or prosocial attitudes (Bonnardel et al., 2018; Melo et al., 2020).

There is equally a need to address *digital disorder.* There is little doubt that the spread of misinformation and disinformation erodes attention. Although many end users, as noted, are disinclined to try to disentangle fact from fiction, there is certainly a need for educators and students to develop the skills to weed through the disorder (Palalas, 2019b). After all, "the abundance of information" accessed via our devices can serve "either as noise or as invaluable input for learning" (Palalas, 2018, p. 39). Since there is no louder or more distracting noise than fake news, it is vital to learn how to navigate this digital soundscape.

Finally, there is a need to address the paradox of *digital disconnection,* with digital users being superficially present online but in actuality disconnected from the self (i.e., diminished intrapersonal connection) and, relatedly, from others (i.e., diminished interpersonal connection). An inability to communicate across differences is a stumbling block in the internationalization of education. Recently rising in prominence, telecollaboration, virtual exchange, or collaborative online international learning (COIL) projects seek to address this disconnection in education and the wider

world (Helm & Guth, 2016; Helm et al., 2020). Indeed, psychological research has established that individual reasoning is deeply flawed, while collaborative reasoning is far more robust (Gee, 2017; Mercier & Sperber, 2017), perhaps above all when it involves cognitive diversity, often linked to identity diversity (Page, 2017; Sloman & Fernbach, 2017). It is, moreover, apparent that today's global problems require the widespread development of the intercultural skills to collaborate across differences in the pursuit of common pathways forward (Gee, 2017; Shi-xu, 2005). As such, in an insight broadly aligned with today's burgeoning field of social and emotional learning (SEL; e.g., Durlak et al., 2016), it may be that identifying ways to develop students' intrapersonal skills (amongst other things, recognizing the contours of their own worldviews) and interpersonal skills (including respecting others' worldviews) constitutes today's grand challenge in education.

Exploring Digital Literacies as a Partial Solution

Recent years have seen increasing interest in digital literacies as a skillset integral to managing meaning in an era of digitally networked communications (Dudeney et al., 2013). Often linked to 21st century skills and commonly discussed in the plural, these literacies are seen as encompassing a growing number of component literacies which are emerging or rising in significance in tandem with evolving technological and sociopolitical conditions (Pegrum et al., 2018). More than 100 digital literacies frameworks were identified as far back as 2015 (Brown, 2017) and more frameworks and definitions are emerging, each tailored to varying needs and contexts, ranging from the global focus of work by UNESCO and UNICEF (Law et al., 2018; Nascimbeni & Vosloo, 2019) through the national foci of school curricula (Hockly, 2016) to a focus on specific domains such as language learning (Pegrum et al., 2018). Differences of detail and terminology notwithstanding, there is considerable common ground between these frameworks in respect of their broad ethos as well as the often overlapping literacies they subsume (Pegrum, 2019a).

A case can be made for viewing digital literacies in general, and certain digital literacies in particular, as having been invoked as part of an incipient response to the spread of digital disarray inside and outside education. From this perspective, digital literacies are effectively "habits of mind" (ELI, 2019) which can be developed to deal with the challenges of distraction, disorder, and disconnection, opening up scope for more purposeful use of digital technologies to participate in learning, as well as to participate in the wider world for which learning prepares students.

Many digital literacies frameworks include a focus on information-related literacies such as *information literacy* or *critical literacy,* often explicitly aligned with the 21st century skills of critical thinking and problem-solving, and sometimes seen as stepping stones to other skills like creativity and innovation. In a narrow formulation, information-related literacies are about how to "effectively evaluate and critique information and its use in the digital age" (ELI, 2019); in a broad formulation, they are about how to "apply a critical lens to all things digital and, by extension, the non-digital world from which digital data emerges and to which it refers" (Pegrum, 2019b, p. 265). Corollaries of information or critical literacy include *data literacy,* referring to the ability to evaluate and utilize big data and its representations (e.g., Ridsdale et al., n. d.), and *algorithmic literacy,* the ability to understand the operation and impact of data-driven algorithms (e.g., Rainie & Anderson, 2017). These interrelated literacies may offer a partial antidote to digital disorder. Meanwhile, in an extension of the wider notion of critical literacy, *critical mobile literacy* zeroes in on issues created

or exacerbated by mobile technologies, ranging from privacy and surveillance concerns to the physical and mental health consequences of "devices eating away at our attentional resources day and night" (Pegrum, 2019b, p. 268). As such, critical literacy may also offer a partial antidote to digital distraction.

Some digital literacies frameworks also include a focus on collaboration-related literacies, aligned with the 21st century skills of collaboration and teamwork. Key literacies include *personal literacy*, referring to the ability to use digital technologies to mold a meaningful online presence as a basis for connecting and interacting with others, which is in turn governed by *network literacy* (e.g., Rheingold, 2012), *participatory literacy* (e.g., Hauck & Kurek, 2017), and even *intercultural literacy* (e.g., Pegrum, 2014). While the notion of constructive interaction is embedded in such literacies, it can be argued that in the contemporary context of a superdiverse world riven with backlashes against diversity, there is a need for a more robust conception of intercultural literacy conjoined with *ethical literacy*, involving the adoption of a stance of ethical pluralism and intellectual humility, recognition of diverse perspectives, respectful communication across differences, and positive and proactive contribution to common global challenges (Forte et al., 2020; Pegrum, 2019b; Pegrum et al., 2018). Putting the self and the other back into education in this manner may offer a partial antidote to digital disconnection.

These kinds of literacies may help us respond to digital disarray, facilitating more positive online experiences inside and outside education. It would seem timely to highlight the common thread connecting such literacies by proposing another literacy explicitly focused on the attentional needs of our time. Like some of those discussed above, it is effectively a macroliteracy, one specifically conceived to simultaneously and coherently address digital distraction (drawing on elements of critical literacy and its extension, critical mobile literacy), digital disorder (drawing on information, critical, data, and algorithmic literacies), and digital disconnection (drawing on personal literacy and its connection to the self, alongside network, participatory, intercultural and ethical literacies and their connection to others). In short, the moment has come to propose a multidimensional concept of *attentional literacy*, centered on achieving awareness and focusing attention amid digital disarray, and informed by the burgeoning general and educational literature on mindfulness which, recasting ancient traditions for the current era, has emerged in response to the exigencies of our accelerated, globalized, digitized lives.

From Mindfulness to Attentional Literacy

In the last decades, there has been a *contemplative turn* in the social sciences, including education, manifested in a growing focus on mindfulness (Ergas, 2019a; Ergas & Todd, 2016). The spreading interest in mindfulness is reflected in the growth of studies and publications alongside the growth of interventions in schools and universities (Ergas & Todd, 2016; Goleman & Davidson, 2017; Khng, 2018; Page, 2019).

This contemplative turn has emerged in a particular sociopolitical, educational, and scientific context. First, our global, technologized knowledge economy is increasingly experienced as alienating and disorienting (Ergas & Todd, 2016), especially given the attentional demands flowing through our informational and recreational media channels (Berthon & Pitt, 2019; Page, 2019;

Palalas, 2018), and it may well be both socially and environmentally unsustainable (Fairclough, 2015). Concurrently, there has been a growth in mobility of people, ideas, and practices, in part supported by the global economy and digital technologies. On the negative side, there have been kickbacks against diversity and, in places, a retreat into political isolationism, religious absolutism, and cultural exceptionalism (Pegrum, 2019b), at the very moment when global co-operation is needed more than ever, given that the planetary consequences of mindlessness are now much greater than the more localized consequences of the past (Berthon & Pitt, 2019). On the positive side, the knowledge flows beginning to build up from the East and South to the West and North have facilitated the "literal and conceptual migrations" (Ergas, 2019a, p. 251) underpinning the expansion of interest in mindfulness.

Second, the contemplative turn is grounded in a subjective turn in the social sciences in general and education in particular. It has been argued that we may be entering an era of post-secularity where boundaries are blurring "between religiosity/secularity/education, subject/object, and science/healing/education" (Ergas, 2014, p. 58). This is an era where the objectification of science (which of course remains valuable) may be balanced out by the development of what Zajonc (2006) has called "an epistemology of love instead of an epistemology of separation"; and it may equally be an era of post-criticality, where the negativity of critical theory and pedagogy (which likewise retains some value) is balanced out by what Hodgson et al. (2017) have called "a love for the world" (p. 18). Certainly, research in the social sciences, including education, has seen a methodological expansion from quantitative to more subjective qualitative approaches, now beginning to be complemented by contemplative methods (Ergas, 2014, 2019a). In parallel, education has seen a growing critique of the modernist, objectivist approach to knowledge, as built into highly standardized education systems, and a growing respect for reflective, first-person education, in the tradition of James, Dewey, and Freire, as a complement to third-person education (Barbezat & Bush, 2014; Bush, 2011; Ergas, 2019a; Owen-Smith, 2018). The openness to knowing oneself that this occasions naturally dovetails with an openness to knowing others, perhaps best reflected in today's aforementioned COIL initiatives. Interestingly, there is also some overlap between contemplative practices and the recent valorization of "slow approaches" to teaching, learning, and research (e.g., Berg & Seeber, 2016; Boulous Walker, 2017; Frith, 2020; Miedema, 2009).

Third, the contemplative turn is grounded in our current stage of scientific development, with evidence now accumulating of the benefits of mindfulness (Ergas & Todd, 2016; Goleman & Davidson, 2017), as espoused in both Eastern (notably Buddhist) and Western contemplative traditions (Owen-Smith, 2018). Neuroscience has shown that sustained mindfulness practice can lead to intentional shaping of the brain through self-directed neuroplasticity (Hanson & Mendius, 2009; Schwartz et al., 2005), with such neurogenesis being activity-dependent (Lillard & Erisir, 2011); that is, regularly repeated experiences, behaviors, and practices can alter the brain and body (Goleman & Davidson, 2017), impacting neurological and psychological functions (Schwartz et al., 2005), including attentional and emotional regulation (Goleman & Davidson, 2017). The construct of mindfulness thus "bridges spiritual traditions and their focus on transforming the 'self' with the evidence-based understanding of the habits of mind offered by contemporary sciences" (Palalas, 2019b, p. 113).

Goleman and Davidson (2017) distinguish between a "deep path" of mindfulness, practiced by monks and dedicated meditators and linked to the Buddhist tradition of self-transformation, and a "wide path" involving the mainstreaming of meditation techniques for secular therapeutic purposes. The latter "minimalist" version of a Buddhist approach (Gethin, 2013, p. 275), despite the pseudo-scientific hype that sometimes accompanies it, has shown considerable promise. Following some interest in contemplative practices in the 1960s and preliminary research in the 1970s (Goleman & Davidson, 2017; Page, 2019), the spread of wide-path mindfulness accelerated from 1979 onwards with the introduction of secular clinical mindfulness-based stress reduction (MBSR) practices as described by Kabat-Zinn in 1990 (with his seminal book later revised and republished as Kabat-Zinn, 2013). His empirically supported MBSR program has entered mainstream medicine and society, becoming widely accepted as a treatment for various psychological and medical disorders, and for promoting general well-being (Ergas, 2014; Goleman & Davidson, 2017; Page, 2019).

The growing interest in mindfulness has produced some conceptual pluralism (Goleman & Davidson, 2017; Owen-Smith, 2018). Nevertheless, core notions relating to awareness and attention span all scholarly discourse, with mindfulness characterized as involving attention, intention, and attitude (Ergas, 2019b); awareness, presence, and acceptance (Owen-Smith, 2018); or present-centered, non-evaluative, non-reflective awareness (Berthon & Pitt, 2019, with ref. to Kornfield, 1977). Perhaps the best-known definition of mindfulness that embraces these concepts comes from Kabat-Zinn (2013): "the awareness that arises by paying attention on purpose, in the present moment, and non-judgmentally" (pp. 28-29). Sometimes misunderstood, non-judgment does not mean avoiding all evaluation but rather distancing ourselves from reactive or habitual judgments to create a clear space for more reflective and discerning choices.

Highly relevant to educational settings is the socio-cognitive lens offered by Langer (1993), who views mindfulness as "a state of mind that results from drawing novel distinctions, examining information from new perspectives, and being sensitive to context" (p. 44), and indeed recognizing the conditional nature of information. Langer (2016) elaborates that a mindful approach entails "the continuous creation of new categories; openness to new information; and an implicit awareness of more than one perspective", which stands in direct contrast to the mindlessness of "being on automatic pilot" (p. 4). Taking a mindful approach and being aware of changing contexts affords an ability to make skillful choices about where to place attention. With educational settings in mind, and in light of Langer's research, we therefore adopt the following working definition of mindfulness: *the mental capacity to pay attention intentionally and non-judgmentally to an object of choice while remaining aware of changing experiences and contexts.*

Benefits of cultivating mindfulness, albeit at times overstated without sufficient evidence (Goleman & Davidson, 2017; Van Dam et al., 2018), have been established in the domains of mental, emotional, and physical well-being. In education, mindfulness has been found to be associated with increased academic and cognitive performance, including improved attention (e.g., Caballero et al., 2019; Edwards, 2016; Ergas, 2019a; Khng, 2018; Mortlock, 2020; Palalas, 2019b). By decreasing stress, anxiety and depression, it has led to improved psychological and emotional well-being in students as well as teachers (e.g., Edwards, 2016; Jennings et al., 2020; Khng, 2018; Lauricella, 2014; Reavley, 2018; Scida & Jones, 2017). Significantly, some literature focuses on the development of the whole person, including a stronger sense of self and holistic well-being, linked to

improved connections with others (e.g., Ergas, 2017; Khng, 2018; Lauricella, 2014, Schoeberlein David & Sheth, 2009; Scida & Jones, 2017; Shapiro et al., 2011).

For lasting effects, it is essential to develop the "muscle of mindfulness" (Kabat-Zinn, 2013, p. 27) through systematic intentional practice. In other words, an investment of time and energy is required at the "mental gym" (Goleman & Davidson, 2017, p. 309) where the muscle of attention can be trained (Levy, 2016, p. 40). Indeed, all well-designed mindfulness practices, starting with traditional meditation techniques, "at their root are practices in strengthening attention" (Goleman & Davidson, 2017, p. 306). Beyond regular meditation, mindfulness can be cultivated through a host of everyday contemplative practices, such as mindful breathing, open awareness, walking meditation, mindful yoga, and more (Ergas 2019b; Palalas, 2019b; Scida & Jones, 2017).

The foregoing discussion highlights the interplay of awareness and intention – key pillars of a mindful approach, alongside non-judgment – which facilitates conscious choices about what to pay attention to and when. If this is important in education as a whole, it is especially important in digital education. In online or blended spaces where our minds are agitated by competing stimuli, the ability to maintain our attentional balance is critical. We therefore need to develop the literacy, or skillset, to manage awareness and attention in such settings. More than a decade ago, Rheingold (2009) suggested that mindfulness can be a tool for developing "attention literacy", a notion that has been gaining traction of late: for Palalas (2018), mindfulness offers a pathway to the "solid digital literacy and 'attention literacy' skills" (p. 23) needed to navigate distractions, while attention literacy and critical literacy are likely to be mutually reinforcing (Palalas, 2019a); for Wenger (2019), mindfulness can help build students' "attention literacy", described as "the ability to consciously deploy and understand the impact of attention in our new media culture" (p. 55); and for Couros (2019), who likewise makes a link with mindfulness, "attention literacy" is critical to reclaiming our commodified, scarce attention.

At the intersection of work on digital literacies – including "attention literacy" as outlined above – and mindfulness, we propose the concept of *attentional literacy,* which we take to mean: *the ability to intentionally direct one's attention, in the present moment, toward information originating from the self, others, and the environment (whether analogue, digital, or blended), and to sustain that attention by choice, while becoming aware of and remaining non-judgmental towards new perspectives, multiple viewpoints, and shifting contexts.* Such attentional literacy results in an awareness of available choices and the capacity to intelligently select what, and what not, to focus attention on – a vital skillset within and beyond education in our era of digital disarray.

What Does Attentional Literacy Offer (Digital) Education?

The extent of the benefits which mindfulness offers education depends in part on the extent of its embeddedness within education. What Ergas (2019b) terms mindfulness *in* education typically entails discrete therapeutic interventions at the level of existing classes, while mindfulness *as* education suggests a holistic approach at the level of an institution, and mindfulness *of* education implies a radical-critical transformation at the level of the whole education system. Attentional literacy lends itself to introduction at the *in* level but has implications for the *as* and even *of* levels. What is clear is that mindfulness, and attentional literacy as a construct linking it to digital literacies,

is broadly aligned with an education-as-empowerment as opposed to an education-as-control narrative (Pegrum, 2019b) or, in an alternative conceptualization, with education as a self-development path as opposed to education as an economic tool (Ergas, 2019a, 2019b).

Mindfulness leads to a broadening of epistemology and what is considered as knowledge (Ergas, 2019a). Rejecting standardization and prepackaged information (Langer, 2000; Langer & Moldoveanu, 2000; Sherretz, 2011), it opens up space for the kind of reflective, first-person education mentioned earlier. While a detailed exploration of mindful pedagogy is beyond the scope of this paper, the published research is suggestive of a general alignment between mindfulness and *(social) constructivism* (e.g., Sherretz, 2011), learning that is *contextualized* within individuals' lives, *situated* in the here and now, and *embodied* (e.g., Berila, 2016; Ergas, 2019a; Langer, 2000), and critical and anti-oppression pedagogies (e.g., Berila, 2016; Helmer, 2014).

But it is when we are confronted with digital disarray, inside and outside the classroom, that attentional literacy may have the most to offer. It is widely accepted that mindfulness can help us deal with the distractions of digital and mobile environments (Berthon & Pitt, 2019; Palalas, 2019b) and the inefficient and ineffective multitasking behaviours they occasion (Page, 2019; Palalas, 2018); focused attention is, after all, precisely "non-multitasking" (Wallace, 2006, p. 38). Mobile learners, especially, may benefit from a strengthened learning focus, whether that entails closing out distracting information in location-independent tasks, or zooming in on relevant information in location-dependent tasks (Palalas, 2018). Attentional literacy can also contribute to addressing digital disorder, as students learn to determine their own informational needs (Palalas, 2018) while resisting being swept up in the mélange of misinformation and disinformation propagated by attention-hungry algorithms (Pegrum, 2019b).

Importantly, attentional literacy may help ameliorate digital disconnection. From a mindfulness perspective, a connection to the self and a connection to others are naturally interwoven (Barbezat & Bush, 2014; Bush, 2011; Tobin, 2018), as seen in the context of whole-person, or holistic, education (Berila, 2016; Ergas, 2019a; Palalas, 2019b) and SEL (Durlak et al., 2016). One of the strongest themes to emerge in research on mindfulness concerns its role in building non-judgmental awareness of multiple perspectives (Berila, 2016; Langer & Moldoveanu, 2000; Sherretz, 2011) regarding both the self and others: a mindful person benefits from an "awareness of the multiplicity of the ways in which she can engage with the contents of her own mind, and the multiplicity of ways she can engage with the world" (Moldoveanu, 2016, p. 26).

Where attentional literacy overlaps with intercultural and ethical literacy – notably in COIL – students may come to know themselves and others better in the process of engaging with difference in blended and online settings. Indeed, students may well encounter the limits of their own worldviews while learning to respect others' views grounded in different lived realities shaped by gender, sexuality, race, culture, and other forms of diversity (e.g., Tobin, 2018). Of central importance is not just an intellectual appreciation of multiple perspectives, but a sense of connection, empathy, and compassion (Barbezat & Bush 2014; Durlak et al., 2016; Goleman & Davidson, 2017; Owen-Smith, 2018). Notwithstanding design challenges in COIL (O'Dowd & Ritter, 2006; Ware, 2017), it can potentially serve as a vehicle for the development of attentional literacy, incorporating a mindful connection to the self and others, as students hone the intra- and interpersonal skills they need to become global (digital) citizens committed to building a more ethical and sustainable world

in which they are ready to contribute to addressing today's planetary challenges (Barbezat & Bush, 2014; Owen-Smith, 2018; Tobin, 2018).

Conclusion: Future Directions in Attentional Literacy Research

This position paper has made an initial case for the educational value of *attentional literacy,* a construct which links digital literacies and mindfulness research, and which holds the potential to help address the effects of digital disarray – including digital distraction, digital disorder, and digital disconnection – both within education and in the wider world outside educational institutions.

It is of course vital to retain a critical lens, recognizing the risks of secularizing ancient mindfulness traditions (Forbes, 2019) or, conversely, proselytizing within secular education systems (Ergas, 2019a); the dangers of a hollowed-out 'McMindfulness' (Purser & Loy, 2013) that may be twisted to serve commercial (and even military) ends, helping to buttress neoliberal capitalism and offering apparently easy individual therapies for structural problems in society and education (Ergas, 2014; Forbes, 2019; Hyland, 2016); and, finally, the potential intrusiveness of expecting students' ready participation in personal mindfulness practices, given a number of documented cases of "dark night" or other adverse psychological experiences (Burrows, 2018; Goleman & Davidson, 2017).

Notwithstanding such unresolved issues, attentional literacy appears to offer some promise of ameliorating the effects of digital disarray and enriching education. Yet there is still much to be learned. From a practical perspective, future research needs to examine how best to operationalize attentional literacy (for instance, with the support of contemplative practices) within our learning designs, before implementing these designs and conducting empirical investigations of the outcomes. From a more philosophical perspective, future studies should consider its deeper implications relating to emotional and even, broadly, spiritual issues around intra- and interpersonal connections. In this paper we have sought to begin a conversation on attentional literacy, but there remains much more to be said.

Acknowledgments

Special thanks are due to Nicky Hockly for suggesting the term *attentional* rather than *attention literacy,* as way to differentiate our current work from past commentary on this area.

References

Barbezat, D. P., & Bush, M. (2014). *Contemplative practices in higher education: Powerful methods to transform teaching and learning.* Jossey-Bass.

Beck, J. (2017, Mar. 13). This article won't change your mind. *The Atlantic.* https://www.theatlantic.com/science/archive/2017/03/this-article-wont-change-your-mind/519093/

Berg, M., & Seeber, B. K. (2016). *The slow professor: Challenging the culture of speed in the academy.* University of Toronto Press.

Berila, B. (2016). *Integrating mindfulness into anti-oppression pedagogy: Social justice in higher education.* Routledge.

Berthon, P. R., & Pitt, L. F. (2019). Types of mindfulness in an age of digital distraction. *Business Horizons, 62,* 131-137. https://doi.org/10.1016/j.bushor.2018.10.003

Bonnardel, V., Biddington, T., May, B., Jones, R., & Roffey, S. (2018). Toward the implementation of contemplative practices in higher education. *Journal of Perspectives in Applied Academic Practice, 6*(3), 3-13.

Boulous Walker, M. (2017). *Slow philosophy: Reading against the institution.* Bloomsbury Academic.

Brown, M. (2017, Oct. 5). A critical review of frameworks for digital literacy: Beyond the flashy, flimsy and faddish – Part 1. *ASCILITE TELall blog.* http://blog.ascilite.org/a-critical-review-of-frameworks-for-digital-literacy-beyond-the-flashy-flimsy-and-faddish-part-1/

Burrows, L. (2018). *Safeguarding mindfulness in schools and higher education: A holistic and inclusive approach.* Routledge.

Bush, M. (2011). Mindfulness in higher education. *Contemporary Buddhism, 12*(1), 183-197. https://doi.org/10.1080/14639947.2011.564838

Caballero, C., Scherer, E., West, M. R., Mrazek, M. D., Gabrieli, C. F. O., & Gabrieli, J. D. E. (2019). Greater mindfulness is associated with better academic achievement in middle school. *Mind, Brain, and Education, 13*(3), 157-166.

Couros, A. (2019). #77 – Attention literacy with Alec Couros. [Interview by W. Richardson.] *Modern Learners.* https://modernlearners.com/77-alec-couros/

Creese, A., & Blackledge, A. (Eds.). (2018) *The Routledge handbook of language and superdiversity: An interdisciplinary perspective.* Routledge.

Darghan Felisoni, D., & Strommer Godoi, A. (2018). Cell phone usage and academic performance: An experiment. *Computers & Education, 117,* 175-187. https://doi.org/10.1016/j.compedu.2017.10.006

Dobelli, R. (2020). *Stop reading the news: A manifesto for a happier, calmer and wiser life.* [Trans. C. Waight.] London: Sceptre.

Dudeney, G., Hockly, N., & Pegrum, M. (2013). *Digital literacies.* Pearson.

Durlak, J. A., Domitrovich, C. E., Weissberg, R. P., & Gullotta, T. P. (Eds.). (2016). *Handbook of social and emotional learning: Research and practice.* Guilford Press.

Edwards, L. (2016). Combining biofeedback and mindfulness in education. *Biofeedback, 44*(3), 126-129. https://doi.org/10.5298/1081-5937-44.3.01

ELI [EDUCAUSE Learning Initiative]. (2019). *7 things you should know about … digital literacies.* https://library.educause.edu/-/media/files/library/2019/7/eli7169.pdf

Ergas, O. (2014). Mindfulness in education at the intersection of science, religion, and healing. *Critical Studies in Education, 55*(1), 58-72. https://doi.org/10.1080/17508487.2014.858643

Ergas, O. (2017). Reclaiming 'self' in teachers' images of 'education' through mindfulness as contemplative inquiry. *Journal of Curriculum and Pedagogy, 14*(3), 218-235. https://doi.org/10.1080/15505170.2017.1398698

Ergas, O. (2019a). A contemplative turn in education: Charting a curricular-pedagogical countermovement. *Pedagogy, Culture & Society, 27*(2), 251-270. https://doi.org/10.1080/14681366.2018.1465111

Ergas, O. (2019b). Mindfulness *in, as* and *of* education: Three roles of mindfulness in education. *Journal of Philosophy of Education, 53*(2), 340-358.

Ergas, O., & Todd, S. (2016). Introduction. In O. Ergas & S. Todd (Eds.), *Philosophy east/west: Exploring intersections between educational and contemplative practices.* Wiley Blackwell.

Fairclough, N. (2015). *Language and power* (3rd ed.). Routledge.

Forbes, D. (2019). *Mindfulness and its discontents: Education, self, and social transformation.* Fernwood Publishing.

Forte, M., Jacobson, T., Mackey, T., O'Keeffe, E., & Stone, K. [with additional contributors]. (2020). 2018 metaliteracy goals and learning objectives. [Last updated Feb. 27, 2020.] *Metaliteracy.* https://metaliteracy.org/learning-objectives/2018-metaliteracy-goals-and-learning-objectives/

Frith, U. (2020). Fast lane to slow science. *Trends in Cognitive Sciences, 24*(1), 1-2. https://doi.org/10.1016/j.tics.2019.10.007

Gee, J. P. (2017). *Teaching, learning, literacy in our high-risk high-tech world: A framework for becoming human.* Teachers College Press.

Gethin, R. (2013). On some definitions of mindfulness. In J. M. G. Williams & J. Kabat-Zinn (Eds.), *Mindfulness: Diverse perspectives on its meaning, origins and applications* (pp. 263-279). Routledge.

Goleman, D., & Davidson, R. J. (2017). *The science of meditation: How to change your brain, mind and body.* Penguin.

Hadar, L. L., Ergas, O., Alpert, B., & Ariav, T. (2020). Rethinking teacher education in a VUCA world: Student teachers' social-emotional competencies during the Covid-19 crisis. *European Journal of Teacher Education, 43*(4), 573-586. https://doi.org/10.1080/02619768.2020.1807513

Hanson, R., & Mendius, R. (2009). *Buddha's brain.* New Harbinger.

Harari, Y. (2020, Apr. 1). Homo Deus author Yuval Harari shares pandemic lessons from past and warnings for future. [Interview by L. Lew.] *South China Morning Post.* https://www.scmp.com/news/china/article/3077960/homo-deus-author-yuval-harari-shares-pandemic-lessons-past-and-warnings

Harford, T. (2017, Mar. 11). The problem with facts. *Financial Times: FT Weekend Supplement – Life & Arts,* p. 18.

Hauck, M., & Kurek, M. (2017). Digital literacies in teacher preparation. In S. Thorne & S. May (Eds.), *Language, education and technology* (3rd ed.). Springer.

Helm, F., & Guth, S. (2016). Telecollaboration and language learning. In F. Farr & L. Murray (Eds.), *The Routledge handbook of language learning and technology.* Routledge.

Helm, F., Guth, S., Shuminov, E., & Van der Helden, B. (2020). Erasmus+ virtual exchange. *Internationalisation of Higher Education, 1,* 91-109.

Helmer, K. (2014). Disruptive practices: Enacting critical pedagogy through meditation, community building, and explorative spaces in a graduate course for pre-service teachers. *Journal of Classroom Interaction, 49*(2), 33-40.

Hockly, N. (2016). *Focus on learning technologies.* Oxford University Press.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, Mar. 27). The difference between emergency remote teaching and online learning. *EDUCAUSE Review.* https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Hodgson, N., Vlieghe, J., & Zamojski, P. (2017). Manifesto for a post-critical pedagogy. In N. Hodgson, J. Vlieghe & P. Zamojski (Eds.), *Manifesto for a post-critical pedagogy* (pp. 15-19). Punctum Books.

Hyland, T. (2016). On the contemporary applications of mindfulness: Some implications for education. In O. Ergas & S. Todd (Eds.), *Philosophy east/west: Exploring intersections between educational and contemplative practices.* Wiley Blackwell.

Jennings, P. A., DeMauro, A. A., & Mischenko, P. (2020). Cultivating awareness and resilience in education: The CARE for teachers program. In I. Ivtzan (Ed.), *Handbook of mindfulness-based programmes: Mindfulness interventions from education to health and therapy* (pp. 219-230). Routledge.

Kabat-Zinn, J. (2013). *Full catastrophe living: How to cope with stress, pain and illness using mindfulness meditation* (revised ed.). Piatkus.

Khng, K. H. (2018). Mindfulness in education: The case of Singapore. *Learning: Research and Practice, 4*(1), 52-65. https://doi.org/10.1080/23735082.2018.1428120

Langer, E. J. (1993). A mindful education. *Educational Psychologist*, *28*(1), 43-50.

Langer, E. J. (2000). Mindful learning. *Current Directions in Psychological Science, 9*(6), 220-223.

Langer, E. J. (2016). *The power of mindful learning* (2nd ed.). Da Capo Press.

Langer, E. J., & Moldoveanu, M. (2000). The construct of mindfulness. *Journal of Social Issues, 56*(1), 1-9.

Lauricella, S. (2014). Mindfulness meditation with undergraduates in face-to-face and digital practice: A formative analysis. *Mindfulness, 5,* 682-688. https://doi.org/10.1007/s12671-013-0222-x

Law, N., Woo, D., de la Torre, J., & Wong, G. (2018, Jun.). *A global framework of reference on digital literacy skills for indicator 4.4.2.* Information Paper no. 51, UIS/2018/ICT/IP/51. UNESCO Institute for Statistics. http://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf

Levy, D. M. (2016). *Mindful tech: How to bring balance to our digital lives.* Yale University Press.

Lillard, A. S., & Erisir, A. (2011). Old dogs learning new tricks: Neuroplasticity beyond the juvenile period. *Developmental review*, *31*(4), 207-239.

List of incidents of xenophobia and racism related to the COVID-19 pandemic. (2020, Oct. 20). *Wikipedia.* https://en.wikipedia.org/wiki/List_of_incidents_of_xenophobia_and_racism_related_to_the_COVID-19_pandemic

Melo, C., Madariaga, L., Nussbaum, M., Heller, R., Bennett, S., Tsai, C.-C., & van Braak, J. (2020). Editorial: Educational technology and addictions. *Computers & Education, 145.* https://doi.org/10.1016/j.compedu.2019.103730

Mercier, H., & Sperber, D. (2017). *The enigma of reason: A new theory of human understanding.* Allen Lane.

Miedema, J. (2009). *Slow reading.* Litwin Books.

Moldoveanu, M. (2016). The construct of mindfulness amidst and along conceptions of rationality. In S. M. Fatemi (Ed.), *Critical mindfulness* (pp. 25-43). Springer.

Mortlock, J. T. (2020). Audio-guided Mindful-Based Social Emotional Learning (MBSEL) training in school classrooms: The inner explorer program. In I. Ivtzan (Ed.), *Handbook of mindfulness-based programmes: Mindfulness interventions from education to health and therapy* (pp. 251-263). Routledge.

Nascimbeni, F., & Vosloo, S. (2019, Aug.). *Digital literacy for children: Exploring definitions and frameworks.* Scoping Paper No. 01. UNICEF.

O'Dowd, R., & Ritter, M. (2006). Understanding and working with 'failed communication' in telecollaborative exchanges. *CALICO Journal, 23*(3), 623-642. https://journals.equinoxpub.com/index.php/CALICO/article/view/23162/19167

Ovadya, A., & Bienstock, H. (2018, Nov. 8). Is your company ready to protect its reputation from deep fakes? *Harvard Business Review.* https://hbr.org/2018/11/is-your-company-ready-to-protect-its-reputation-from-deep-fakes

Owen-Smith, P. (2018). *The contemplative mind in the scholarship of teaching and learning.* Indiana University Press.

Page, K. (2019). *College mindfulness training: Reducing student life stress and improving academic performance.* Routledge.

Page, S. E. (2017). *The diversity bonus: How great teams pay off in the knowledge economy.* Princeton University Press.

Palalas, A. (2018). Mindfulness in mobile and ubiquitous learning: Harnessing the power of attention. In S. Yu, M. Ally & A. Tsinakos (Eds.), *Mobile and ubiquitous learning: An international handbook* (pp. 19-44). Singapore: Springer. https://doi.org/10.1007/978-981-10-6144-8_2

Palalas, A. (2019a). How can we connect mobility with mindfulness? In M. Pegrum, *Mobile lenses on learning: Languages and literacies on the move* (pp. 118-119). Springer.

Palalas, A. (2019b). Mindfulness for human-centred digital learning. *Argentinian Journal of Applied Linguistics, 7*(2), 110-125.

Pegrum, M. (2014). *Mobile learning: Languages, literacies and cultures.* Palgrave Macmillan.

Pegrum, M. (2019a). Digital literacies in language education. [Interview by J. da Silva Cardoso.] *Matraga, 26*(47), 462-469. https://doi.org/10.12957/matraga.2019.44077

Pegrum, M. (2019b). *Mobile lenses on learning: Languages and literacies on the move.* Springer.

Pegrum, M., Dudeney, G., & Hockly, N. (2018). Digital literacies revisited. *The European Journal of Applied Linguistics and TEFL, 7*(2), 3-24.

Purser, R., & Loy, D. (2013, Aug. 31). Beyond McMindfulness. *Huffpost.* https://www.huffpost.com/entry/beyond-mcmindfulness_b_3519289

Rainie, L., & Anderson, J. (2017). Code-dependent: Pros and cons of the algorithm age. *Pew Research Center.* https://www.pewresearch.org/internet/2017/02/08/code-dependent-pros-and-cons-of-the-algorithm-age/

Reavley, N. J. (2018). Mindfulness training in higher education students. *The Lancet: Public Health, 3*, e55-e56. https://doi.org/10.1016/S2468-2667(17)30241-4

Rheingold, H. (2009, Apr. 20). Attention literacy. *SFGate.* http://www.sfgate,com/cgi-bin/blogs/rheingold/detail?entry_id= 38828

Rheingold, H. (2012). *Net smart: How to thrive online.* MIT Press.

Ridsdale, C., Rothwell, J., Smit, M., Ali-Hassan, H., Bliemel, M., Irvine, D., Kelley, D., Matwin, S., & Wuetherick, B. (n. d.). *Strategies and best practices for data literacy education.* Knowledge synthesis report. Dalhousie University. http://www.mikesmit.com/wp-content/papercite-data/pdf/data_literacy.pdf

Schoeberlein David, D., & Sheth, S. (2009). *Mindful teaching and teaching mindfulness: A guide for anyone who teaches anything*. Wisdom Publications.

Schwartz, J. M., Stapp, H. P., & Beauregard, M. (2005). Quantum physics in neuroscience and psychology: A neurophysical model of mind-brain interaction. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *360*(1458), 1309-1327.

Scida, E. E., & Jones, J. N. (2017). Navigating stress: Graduate student experiences with contemplative practices in a foreign language teacher education course. *The Journal of Contemplative Inquiry, 4*(1), 207-228.

Shapiro, S. L., Brown, K. W., & Astin, J. (2011). Toward the integration of meditation into higher education: A review of research evidence. *Teachers College Record, 113*(3), 493-528.

Sherretz, C. E. (2011). Mindfulness in education: Case studies of mindful teachers and their teaching practices. *Journal of Thought,* fall-winter, 79-96.

Shi-xu. (2005). *A cultural approach to discourse.* Palgrave Macmillan.

Sloman, S., & Fernbach, P. (2017). *The knowledge illusion: Why we never think alone.* Macmillan.

Spring, M. (2020, May 27). Coronavirus: The human cost of virus misinformation. *BBC News.* https://www.bbc.com/news/stories-52731624

Stone, L. (2009, Nov. 30). Beyond simple multi-tasking: Continuous partial attention. *Linda Stone.* https://lindastone.net/2009/11/30/beyond-simple-multi-tasking-continuous-partial-attention/

Stosny, S. (2017, Feb. 6). He once called it 'election stress disorder.' Now the therapist says we're suffering from this. *The Washington Post.* https://www.washingtonpost.com/news/inspired-life/wp/2017/02/06/suffering-from-*headline*-stress-disorder-since-trumps-win-youre-definitely-not-alone/

Tobin, K. (2018). The role of mindfulness in harmonising sustainable lifestyles. *Learning: Research and Practice, 4*(1), 112-125. https://doi.org/10.1080/23735082.2018.1435039

Van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., Meissner, T., Lazar, S. W., Kerr, C. E., Gorchov, J., Fox, K. C. R., Field, B. A., Britton, W. B., Brefczynski-Lewis, J. A., & Meyer, D. E. (2018). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science, 13*(1), 36-61. https://doi.org/10.1177/1745691617709589

Vertovec, S. (2007). Super-diversity and its implications. *Ethnic and Racial Studies, 30*(6), 1024-1054. https://doi.org/10.1080/01419870701599465

Wallace, B. A. (2006). *The attention revolution: Unlocking the power of the focused mind*. Wisdom Publications.

Ward, A. F., Duke, K., Gneezy, A., & Bos, M. W. (2017). Brain drain: The mere presence of one's own smartphone reduces available cognitive capacity. *Journal of the Association for Consumer Research, 2*(2), 140-154. https://doi.org/10.1086/691462

Wardle, C., & Derakhshan, H. (2017, Sep. 27). *Information disorder: Toward an interdisciplinary framework for research and policy making.* Strasbourg: Council of Europe. https://edoc.coe.int/en/media-freedom/7495-information-disorder-toward-an-interdisciplinary-framework-for-research-and-policy-making.html

Ware, P. (2017). Technology, new literacies, and language learners. In C. A. Chapelle & S. Sauro (Eds.), *The handbook of technology and second language teaching and learning* (pp. 265-277). Wiley Blackwell.

Wenger, C. I. (2019). Teaching attention literacy: A case for mindfulness in the composition classroom. *Pedagogy: Critical Approaches to Teaching Literature, Language, Composition, and Culture, 19*(1), 53-78. https://doi.org/10.1215/15314200-7173752

Whelan, E., Najmul Islam, A. K. M., & Brooks, S. (2020). Applying the SOBC paradigm to explain how social media overload affects academic performance. *Computers & Education, 143.* https://doi.org/10.1016/j.compedu.2019.103692

WHO [World Health Organization]. (2020, Sep. 23). *Managing the COVID-19 infodemic: Promoting healthy behaviours and mitigating the harm from misinformation and disinformation.* Joint statement by WHO, UN, UNICEF, UNDP, UNESCO, UNAIDS, ITU, UN Global Pulse, and IFRC. https://www.who.int/news-room/detail/23-09-2020-managing-the-covid-19-infodemic-promoting-healthy-behaviours-and-mitigating-the-harm-from-misinformation-and-disinformation

Wong, J. C. (2020, Apr. 28). 'There is no absolute truth': An infectious disease expert on Covid-19, misinformation and 'bullshit'. *The Guardian.* https://www.theguardian.com/world/2020/apr/28/there-is-no-absolute-truth-an-infectious-disease-expert-on-covid-19-misinformation-and-bullshit

Zajonc, A. (2006). Love and knowledge: Recovering the heart of learning through contemplation. *Teachers College Record, 108*(9), 1742-1759.

Authors

Mark Pegrum is an Associate Professor in Digital Learning in the Graduate School of Education at The University of Western Australia. His recent books include: *Mobile Lenses on Learning: Languages and Literacies on the Move* (Springer, 2019), and *Digital Literacies* (2nd ed., with Nicky Hockly & Gavin Dudeney, Routledge, in press). Email: mark.pegrum@uwa.edu.au

Agnieszka (Aga) Palalas is an Associate Professor and EdD Program Director in Open, Digital and Distance Education at Athabasca University, Canada. Drawing on her three-decade-long experience as an educator and instructional designer, combined with her mindfulness practice, Aga has focused her research on innovative pedagogies and digital technologies for human-centred learning. Email: agapalalas@athabascau.ca