

WEB SCIENCE IN SE ASIA: CULTIVATING A 'THAI DIGITAL RENAISSANCE' THROUGH (RE)INTRODUCING AN INTERDISCIPLINARY SCIENCE IN HIGHER EDUCATION

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Abstract

Inseparable from the communication of knowledge through the World Wide Web, the study of online social interaction and communication in South East (SE) Asia is growing. The teaching of digital media literacy raises challenging debates for those in Higher Education (HE), especially in a burgeoning digital economy such as Thailand. The advances in technology, growth in mobile connectivity and social media have proliferated online political, social and personal movements, as well as providing a convenient alternative for offline communication. Thailand is emerging into a digital renaissance, but its education system is still lacking pedagogy to support learning for young digital natives.

The Thailand 4.0 initiative, a government reform, seeks just that; it challenges Thai HE to innovate teaching a digitally empowered, connected body of students who are now interconnected global actors, shaping complex heterogeneous networks as influencers, users, contributors, and critics. The increase in not only their power but knowledge of how to use the Web, an asset to extend their cultural identity and social capital, raises critical questions about such a burgeoning 'Thai digital renaissance'. Undoubtedly, we need new ways to equip students as critical learners who can reflect on the inescapable interdisciplinary practice of complicated topics in their study, which includes issues like fake news, revenge pornography, social media journalism and even domestic law in SE Asia, which impact censorship and digital rights.

Problematically, these are not simply social or technical phenomena; they are interwoven, which for students new to thinking critically is hard to comprehend. Yet, an emerging discipline, Web Science, offers an interdisciplinary approach to solve this, one changing the view that studying the Web is technical, so understood through knowing how to make lines of code. In this paper, we conceptually integrate two core knowledge components that are intrinsic to Web Science, that of interdisciplinarity and sociotechnical heterogeneity, with current issues surrounding public opinion in Thailand, to offer a reintroduction, for a new audience of researchers, to a discipline we playfully conclude as #webscithai. So, a call to the academic community of Thailand to embrace a sociotechnical pedagogy useful for educating and empowering students in Thailand as global digital citizens.

Keywords: Education. Digital Literacy. Public Opinion. Web Science. Web Science in Thailand.

1. Introduction

The World Wide Web has redefined our society, with more than half of all the people of Earth connected by it; these people are digital actors who share a lot of public opinions. Undoubtedly, the Web wasn't intended for this purpose, growing far and beyond what its inventor, Sir Professor Tim Berners-Lee, expected when he introduced it in 1989 [1]. Then, the Web was technical links shared using an accessible set of information communication protocols: HTTP, HTML and URL. In the last three decades, these technical processes have become grander, leading to an intersection between society and technology [2]. We see, emerging from this intersection in South East (SE) Asia, digital culture, a data economy, literacy and language, both computationally semantic and ontological. Add to this, a digital industry, intercultural supranational clashes and the redefinition of personal agency be it financial, social, political or even geographical, as more turn to online entrepreneurship.

For those in research, on the ground in SE Asia, fluctuations in digital rights, responsibilities and access entitlements, curtailed by social, political and industrial forces, create challenges for those in Higher Education (HE). For both students or teachers, we face debates about the communication of knowledge, as public opinion, in what was meant to be a pro-human Web grounded by net neutrality and democratization [3; 4]. This is a problem in SE Asia; we don't have a democratic charter of digital rights, helpful in a regional area where conflict, even regarding digital freedom, arises often, yet reform to local laws ensure accessibility and neutrality are slow to arrive [5; 6]. Developing nations in SE Asia are becoming significant technological contenders globally; Thailand is no exception, holding a prominent position, yet censorship of public opinion online, in particular, has led to imprisonment [6; 7].

Human rights researchers in SE Asia have argued against laws in favor of digital repression, which paint a dark landscape of the management of the Internet by Thai governance [8; 9; 10]. Yet, the digital status quo isn't entirely gloomy. Whilst censorship laws can, do and often, problematically, apply to the Web and it is intended to exist beyond the governance of any state, corporation or individual, an immersed younger generation of digitally empowered Thai natives are finding the situation buoyant. Affordable Web technology has helped bridge the digital divide, as connectivity has risen dramatically through mobile devices and 4G coverage [11]. Improvements to national broadband infrastructure and relatively affordable data access, bought in local stores, now mean less constrained and censored networking systems and more inclusive, connected digital communities within Thailand [12].

Add to that, recognition of the value of digital skills by the Thai government, who, through positive guidance by royal decree, formed the Digital Government Development Agency in 2018, which strives, through an initiative known as Thailand 4.0, to develop public policy to help students, and citizens become knowledgeable digital actors, serves to create what we describe as a Thai digital renaissance [13]. Such a renaissance is a model for SE Asia as a whole; helped, then, by national changes, providing educational skills in HE is a key development. Thailand 4.0, at an academic level, likewise seeks to westernize and reform academic standards of research, teaching and ethics through

reforms forcing educational institutions to embolden their syllabi to build up Thai digital society [14]. Indeed, this is a regulatory component of learning in HE to prepare future citizens of Thailand to work in the new digital economy, with concerns more about the specialism needed to meet such requirements, than their existence in the first place [3].

As such, questions prevail about how the academic community can fulfill Thailand 4.0 [14]. In this paper, the position is adopted is one that we cannot fully explore the teaching of communication, public opinion, digital society, culture or, as a whole, empower Thai society through any aspect of media literacy without understanding the Web. After all, the Web now underpins all such activity and has become a primary mechanism of interaction in the digital era. Hence, in order to understand public opinion, or develop an empowered attitude amongst citizens in Thailand, we need to ensure that, within Thai HE, we are ensuring that our curriculums have defined principles for Web education [3; 4; 5]. There is, after all, no digital without the social and technical; both are forces creating 'sociotechnical' phenomena within a network of networks we call 'the Web' for simplicity [2; 4; 5].

Such a Web is more than a series of technical links. So, when we teach about it within Thai HE, we need to explore it through social cultures, technical formats of media and even the interactions, perhaps even intersections, between the two. Problematically, we often, in Thai HE and far beyond, teach the Web as a subset of technical disciplinary areas. Not, then, one built moment by moment through the social action of technical coders alongside corporations, economies, social habits, and personal preferences. To fully know the Web involves a degree of understanding of coding, which is intrinsic to Computer Science. So, to be literate in understanding how social public opinion is shaped by the Web, we need some literacy about technicality. Yet, computer scientists alone have been slow to study the Web as a social phenomenon and this has reduced our understanding of the complex social networks that take shape within it. Ironic, given the impact of the social users and their public opinion, whose consensus drives industry [4; 5; 15].

What we can take from this thinking is that technological innovations are driven by social communities of practice, which reshape this industry that we call the Web into what is a temporarily stable socio-technical phenomenon. Digital innovations and activity exist as something in praxis, so formed as an interplay between the social and technical forces that co-construct the Web [4; 16]. This isn't new thinking; the exchange of opinion amongst the public has been reshaped by new technical innovations to share language, literacy and connectivity since the Italian Renaissance [3; 4]. To draw from Anderson's Imagined Communities, the Web is a destabilizing influence on historic identities, because it reshapes the way we share our opinion, align to nations and define ourselves by connecting to a global audience. This raises questions about the teaching of knowledge and its subsequent power, in the context of public opinion [17].

2. Public Opinion: Power & Socio-technicality



Unlike in Anderson's view, which proposes finite, if fluid, boundaries to imagined communities, Web 'nations' are sociotechnical constructs formed around opinion, an imagined political community constructed by technical-material forces, yet one that exists tangibly in social minds, connections and up-likes, despite displaced supranational relationships between actors [4; 5]. Facing an uncertain digital future, where corporate players, politicians, and YouTubers, Instagram starlets now have an unprecedented level of influence over social opinion and technical affinity via the Web, becoming 'digital nations' governing communities in their own right, the way we teach needs to consider the interdisciplinary ramifications of this knowledge-power relationship and how it is changing society. Here, in this well-established idea, we find the first core component intrinsic to the discipline of Web Science: that users create knowledge and wield power in unpredictable, important and capitalizable ways [3; 4; 5].

So, it is essential to recognize that the publication of information, as opinion or habitual activity by users with agency and supranational influence through the Web, is intrinsic to the operations of power found on the Web. Public opinion is itself a form of knowledge, so useful capital that can be redistributed in ways that create power. Such opinion, then, is more than just meaningless information carried through the Web. Instead, a single tweet expressing an opinion is a socio-technical construct of power expressed into complex communities online, which creates influence and insight, that itself constructs power. This is itself an idea as old as the printing press; since the age of enlightenment, we have relied on the publishing of public opinion, as communicated words, to act as vehicles of power [17]. Embedded in this idea is thinking drawn from the notable social philosopher Michel Foucault, who argued that knowledge of any form is inseparable from the dynamics of power and so exists across all surfaces found within a given phenomenon [18].

The exchange and expression of opinion, as knowledge within social media and online communication as a whole, is not something possessed by just one person, the creator, but is defined and shaped by individual agency, capacity and knowledge of the structures, institutions and means of communication such opinions exist and are transported within. Put another way, the expression of opinion online, within major social media websites that might include, for example, Twitter.com or email applications facilitated by the biggest player of them all, Google, is not just 'owned' by the opinion creators. Their opinions are temporarily contingent actors in complex networks stabilized by dynamic relationships with such 'major players' as structural forces, institutions that act as vehicles of power engaged in a contract with the individual [18; 19]. The Web, then, is not just a technical infrastructure built on communication protocols sharing opinion between two given parties, the creator and intended recipient. The Web is a dynamic, temporarily contingent actor born from manifestations of knowledge and opinion shared, which can change unpredictably [16; 17]. Hence, concepts of privacy, human rights, user responsibilities and opinions are not separate from the technical parts of the Web. Indeed, Thai citizens face pressures over the expression of public opinion; their opinions have power and the knowledge contained within such opinions can reshape institutions

because the Web connects them too much wider audiences and this connectivity introduces new challenges for Thailand [18; 19].

Likewise, it raises a significant, some might say inevitable, need to question how we, as educators, can develop the curriculum of students with Thai HE who study subjects aligned to communication and digital literacy. As a country growing in popularity as a global tourist destination, Thailand can be a model for social empowerment throughout SE Asia and do a lot to promote digital equality and knowledge, however, we cannot ignore that with this greater touristic reach comes a much wider exposure to the norms and principles of the west, which include freedom of speech and expression without reprisal [20; 21]. For academics who can position a curriculum to address the digital complexity growing in SE Asia, there exists the opportunity to not only redefine HE teaching to improve critical reasoning but empower students through Thailand 4.0. But this starts with having a curriculum developed in such a way as to link the complexity of public opinion with the nuanced and delicate task of discussing digital rights, knowledge and power through social and technical contexts.

Problematically, freedoms, in particular in expression, struggle against fears of outspokenness; concerns in Thailand, for example, about republicanism or, indeed, anti-establishmentarianism have long tempered freedoms of speech. If personal opinions are made public, as some might think is instinctively legal through the openness of the Web, they may fail to realize that such opinions, when published online, are in contradiction of Thai law [23; 24]. Indeed, even in private, expression of public opinion in a digital format is controversial, due to vague legislation regarding the Web in Thailand and a cultural tendency towards self-surveillance. Such self-surveillance is commonplace in Thailand; known as a 'land of smiles' due to tourism campaigns set up to rehabilitate Thailand's image from sex tourism, censorship and nationalism, despite nationalist songs played everywhere, from supermarkets to daily roll call at schools [21; 22].

An emerging question, for educators within Thai HE, then, is how does such a society cope with the concept of online residency and the exchange of digital opinions, when these are shared in a realm where you can choose your own identity and make people see what you want? Further, how can we equip citizens to cope with digital freedoms, anonymity and scale of communication now on their phones and in their homes, when they likewise have resided geographically in a setting without such universal freedoms? This dichotomy demands an educational agenda; Thailand 4.0 is a way to enhance understanding of digital society, its place within Thailand and so educate people to think critically about their digital activity, so avoid harsh penalties for posting the wrong thing, in the wrong place. Within the context of the Web, this problem in Thailand is undoubtedly helped along by bellicose digital legislation, which includes ISP filtering, reminding citizens of the need to monitor their behavior, but on the Web, it is all too easy to forget that you are not a free, supranational actor connected to a global digital economy [23; 24].

For those beyond Thailand, it is important to realize that public expression, be it online or offline, of controversial opinion is uncommon. For example, when, in early 2018, Boonsri

Sangyoktrakarn was filmed and shared on social media taking an ax to a truck blocking access to her Bangkok property, after the ineffectual protest by other means [24; 25]. She became a digital media sensation; first, as a pariah for governmentally aligned news media, then later as a public hero, one seen and then shared through the lenses of the multiple camera phones recording that day, who created knowledge, opinion and expression then re-shared online through comments, opinions and up-likes, as pushing against a reluctance in Thailand to recognize the importance of opinion, objection and expression; these actions and actors shaped a sociotechnical network both online and offline [25]. Sangyoktrakarn's violent objection shaped a network that was so far-reaching that it was even discussed at length in The Bangkok Post as a discussion of the pent-up anger citizens felt amidst the 'wild west frontier of bureaucratic lawlessness' and stricter rules related to the expression of opinion [25; 26].

Laws in Thailand, for the communication of public opinion, have undoubtedly changed in recent years, all justified in the name of public decency [24; 25]. Not unsurprisingly, public opinion shifted on social media as unrest followed. Not long after Sangyoktrakarn's 'Bangkok ax-lady' story hit the news, widespread national protests unfolded in Bangkok regarding delays to democratic processes [25]. Intriguingly, many protests pointed to the contradictions, conflicts and censors in the modes of public communication and freedom to express an opinion without realizing the Web inherently encourages liberality and its disconnected, dispersed nature encourages distance from the point of interest [26; 27].

This manifestation of public opinion and its subsequent dissemination through social media, by onlookers on the Web, furthers our understanding of this core concept of Web Science. So, we need to draw on knowledge from the social sciences as well as those more technical to empower our critical understanding of such complex, socio-technical phenomena. This requires us to embrace the idea of sociotechnical co-construction; we cannot cleanly separate, then, onlookers, their mobile phones, the lenses and camera software found within them, the words expressed in status updates and even the retweets of this knowledge, from the social impetus, power disequilibrium and emotion that provoked Sangyoktrakarn's violent objection in the first place. Further still, laws regarding public decency and damage are part of an intricate, heterogeneous socio-technical network of actors, themselves playing a role as non-human things with real power over humans [4; 5].

Such a network is a heterogeneous entity, so one built from many different types of actors, who together form a complex co-constructed network of networks made up of competing and contrasting forces that shape observable phenomena. This phenomena, then, is not inherently social or technical, but is built by a mutual shaping of social and technical forces working together to produce unexpected and evolving networks we simply see from the outside and label accordingly [3; 4; 5; 28]. Because of this, we need to look across disciplines, rather than just within one, to understand the whole range of insight that the social sciences have to offer. For example, Science and Technological Studies (STS) is a prominent disciplinary endeavor that considers the relationship between society and technology: within this debate, discussion has long focused on whether technology constructs society

or society constructs technology [28]. The Web is no exception to this discussion, yet changes the debate, because it is built in the moments shared between society and technology together, so co-constituted in a way that one cannot exist without the other [2; 5; 6].

This shifts our perspective, as educators and researchers, away from ideas of ‘technological determinism’, a social theory that suggests communities and the way we use technology changes inevitably and only because of technical governance first, so we are defined by rules and protocols in essential isolation because these rules set boundaries that govern the way our societies and communities of practice take shape [28; 29]. Moreover, it pushes even beyond a further disciplinary perspective known as the Social Construction of Technology (SCOT), which asserts that technology is shaped and influenced by social interpretation and thus remade in an ongoing process by the flexible practices of social groups and their consensus [3; 28; 29; 30]. It is necessary to move beyond both because neither fully explains the Web or the complexity of the phenomena occurring within it. We cannot, therefore, in any educational vantage or perspective, lend inherent exclusivity to either the social or the technical as, for example, a dominant explanation for the network performativity of a Sangyoktrakarn’s digitally disseminated protest [31; 32].

Put another way, to borrow from Haraway’s acclaimed work *A Cyborg Manifesto* (pp.5-9), Sangyoktrakarn’s actions forged a ‘chimeric’ network of actors where she, the focal point, was transformed into something near to a sociotechnical cyborg, so an actor whose activity became a “...hybrid of machine and organism, a creature of social reality as well as a creature of fiction.” because her expression of public opinion shaped social relations through technical infrastructures that directly led to what we might summarize as a “...revolution of social relations in the Oikos, the household.” As Haraway (pp.12-14) claims, “...writing, power, and technology are old partners in Western stories of the origin of civilization, but miniaturization has changed our experience of mechanism... contrast the TV sets of the 1950s or the news cameras of the 1970s with the TV wristbands or hand-sized video cameras now advertised”. Undoubtedly, the ubiquity and presence of hybridized technologies in these newly unfolding SE Asian ‘stories’ makes it necessary to rethink how technical machines are eminently portable, so accessible and increasingly empowered actors in what is practically a digital Wild West; we are now seeing, for the first time, in Thailand the emergence of complex network phenomena tied to the Web, by which we do not just contend, so mean, technical networks, but intricately complex phenomena in places, where prior to the increase of accessible mobile access there was far less connectivity and, much like in the 1800s homesteader rush, we can now witness digital territory grabs and clashes with law as citizens become more exposed [3; 4; 5].

Thai users not only have agency but play a role in the immersive human experience that is the Web [32]. To this end, then, we need to embrace a philosophy for learning where we emphasize the non-human and technical material in shaping social agency, without over-emphasizing the social at the expense of the technical [3; 4]. So, we need to educate students to be capable of describing non-human technical actors with equality, recognizing the performances of social heterogeneous actors alongside them, who together who make up the whole co-constituted sociotechnical network

underpinning a given digital phenomenon related to the communication of opinion. Put another way, when teaching about the Web, then, we want to avoid trying to disentangle social outcomes from technical explanations. If we do this, we find ourselves inherently disadvantaged and without a clear understanding of the actual nature of a given digital phenomenon, which reduces our knowledge and subsequent power to make critically informed decisions about the Web, or any activity we may engage within it [30; 31: 32].

Bruno Latour, a notable sociologist who explores the sociotechnical dynamics and formation of actor-networks, in his seminal work *Reassembling the social: An introduction to Actor-Network-Theory*, stresses that we oversimplify the complexity of the sociotechnical networks around us, in order to make them easier to understand. By doing so, we reify them in such a way as to ignore the full extent and richness of such networks and discount how they are co-constructed in the intersection between the social and technical, so are thus inherently sociotechnical [2; 3; 4; 31]. In earlier work, Latour exemplifies this idea by tracing the actors in the networks that surrounded Louis Pasteur's famous inoculation discoveries [31]. In this, he asserts the fame and recognition placed on Pasteur, as an individual focal actor, ignores his discovery was a multifaceted, temporarily stabilized network that came together 'in the right way, at the right moment' only because of a variety of actors that included even germs, Petri dishes and a cleaner who forgot to wash them [31]. Sociotechnical network phenomena we call 'discoveries' help us to 'see' science and create the impression of a much more consistent, so fixed phenomenon. For Latour, this impression is a black box, one built in such a way as to give the impression that something solid [2].

Taken through a Latourian lens, the Web, or any part of it, is not just one thing, but it is fact a stabilized network of sociotechnical networks made up of vastly different, contingent social and technical forces that are inherently interdisciplinary and operates by different forms of opinion, incentivization and argument, with actors coming together to change the status quo by using knowledge as a mechanism of power [3; 7; 31]. So, if we treat Twitter.com as just a technical social media platform for sharing a personal opinion, we underestimate the complexity of the negotiations of knowledge and power that exist within the opinion-driven actor-network. From an educational perspective, failing to teach students to trace all the actors in what are complex, sociotechnical networks nested within Twitter.com, reduces their capacity to understand the phenomenon they are a part of, limiting their power. However, assuming any activity within the Web, such as the sharing of public opinion through social media, is simply a social media phenomenon negates that technical actors play an equally important role in helping to arrange network activity and facilitate tweets to connect with users and users with tweets. In the Latourian tradition, both form over problematization; people post because they want to be heard and often post because they identify a form of challenge, which drives the passion and intent in the context of their posting [33; 34].

3. Public Opinion: Combating Thai Fake News

This concept of opinion uniting actors around a common problem and the subsequent sociotechnical network that takes shape is described by Latour in his work often; the author stresses



the role of a 'focal actor' that connects individuals around a shared goal: to solve or create change [2; 31]. So, Latour argues, both the human and non-human actors must be treated with equality and so seen as having equal agency, as each chimerical shape outcomes on the Web [2; 32; 34]. Taken this way, not only do we need to treat technical actors as powerful in shaping public opinion online, but we need to likewise shape a curriculum that teaches about them alongside the social forces facilitated by them [3]. This requires an inherently interdisciplinary approach to curriculum design, reflecting the second core concept found within the discipline of Web Science, that of interdisciplinarity. We emphasize here, then, that by limiting ourselves to just one set of tools, disciplinary perspectives or even one set of actors as focal in a given problem, we inherently cut off insight from a discussion about the Web and the public opinion taking shape throughout and deeply within it on a moment-by-moment basis.

The problematic nature of public opinion is, however, that, to borrow from Kuhn (p.23), those who lack critical reasoning skills and development often think "...all people have a right to their opinions, so all opinions are equally right." and so are often surprised when such opinions lead them into conflict [35]. There is a clearly relevant concept, here, then, about regulation of opinion and its dispersal within the Web; in a system without traditional or well-defined aspects of governance, this invites balances and challenges for power [36]. In the tradition of noted sociologist Max Weber and Karl Marx, as reflected upon concisely by Kurawa (p.38), the sharing of public opinion unites groups in social consciousness often around a problem, a form of disagreement, which assists in "...the emergence of class consciousness, and makes evident the advantages of solidarity, of collective action to multiply the industrial bargaining power of the workers, and eventually to overthrow the capitalist system." This, applied to the Web, suggests a shift in the control of knowledge, as power embedded in the communication and connectivity of opinion; very much, then, akin to Weber's ideas of 'bargain striking' between individuals [37].

So, by introducing individuals into a wider socio-technical network made up, in part, by the activity of people who can then be influenced, coerced or used, which generates more knowledge to fuel power through the shaping of opinion as a tool to forge obedience in others, a concept again of Latourian sociology, inherent challenges to authority arise that can reshape institutionalized structures of power, such as governments, which further reshape and influence counter-power movements against that very same means of communicating opinion, which includes the Web and it is no surprise that acts of censorship, access restriction and filtering follow accordingly in certain nation-states [2; 38]. Hence, within the Web, any concentrated 'militant behaviors' are essentially inseparable from the expression of controversial public opinion, which is itself a form of knowledge that has the power to shape, reshape or create networks of actors; this would be seen in the Marxist tradition as inherently emerging where any force of 'workers' within sociotechnical networks unite together in consensus. In the Web, our essential digital users contribute data, retweet and up-vote, acting akin to a workforce driving what is essentially a 'digital public opinion economy' as a by-product their usage output [39; 40].



This data economy is capitalized upon by actors with power, who act to facilitate, and at times censor, opinions, which inherently pushes individuals together into a homogenous community forged in a heterogeneous network of networks [4]. Users of the Web follow each other and fuel opinion by enrolling, sharing, retweeting, up-liking and reinforcing each other in what are intrinsic communities of interest and practice. So, this shapes a temporarily stable, so conditionally contingent interdisciplinary relationship between social networks, technical forces and institutional powers that forge a much wider socio-technical, heterogeneous network of networks we simply refer to as the Web because we see the phenomenon encasing all such activity and not, then, the network intricacies held within it [2; 3; 4; 15]. For Marx and Dahrendorf, as summarized by Karawa (p.40, our emphasis), relationships found in such networks are key to their stability, often defined by the capacity of an actor to 'own' capital, be it technical, social, political or even personal, as likewise asserted by Bourdieu as the embodied idea of cultural capital that drives interaction [38; 39; 41].

Dahrendorf, in particular, implies Marx's emphasis on the reductions of material ownership capacity, through engaging in an encapsulated working contract of mutual interest and thus getting something by giving up more of something else, was increasingly less important as a given society became more technologically co-dependant and co-constructed [40]. Co-construction, then, lends itself inherently to the concept of interdisciplinarity, because instead, for Dahrendorf, and as explored by Karawa, now what increasingly mattered was a relationship based in authenticity, so convincing uses and manipulations of knowledge to generate power, so control, within a network; such an idea is about revolutions of power, but not revolutionary as both authors echo strongly the work of Weber and Foucault, who likewise echoed Latour in his view emphasizing the relationship of associations between individual entities with agency, emphasizing the emergence of an actor whom forms a 'commanding class' role in the network, which lends itself inherently to network dominance because those with sociotechnical capital have the power to shape activity [2; 39; 30].

As knowledge is an intrinsic component of power, which shapes the way individuals make and share information online, including public opinion, then, logically, the sharing of that opinion itself can accumulate and manifest in such a way as to reshape or threaten those actors who dominate the network [2; 6]. Consider the rise of Youtube celebrities and their followers' influence, which often exceeds a readership of traditional print media. Such celebrities act as focal actors in networks that distribute news, yet have little formal regulation because the Web is a decentralized, supranational phenomenon. It's no surprise, then, that governments and institutes seek to establish protocols and practices that can shape this deregulated sharing of knowledge, especially given the rise of alternative influencing networks, both actors and organizational formations, that distribute digital media as a repository. So, many everyday users turn to new sources of knowledge in order to gain understanding in non-traditional formats, shaping unconventional insight and knowledge, which empowers their decision making- but such focal actors lack the same kinds of regulatory influences as, say, print media or governments. It is no surprise that faced with a free digital press for their news and opinion-shaping,

Thai citizens are becoming educated to speak their minds- but this comes with problems and, for some, lengthy imprisonments [10].

As Rebecca Lewis's, in a 2018 Data & Society Research Institute Report: *Alternative Influence: Broadcasting the reactionary right on Youtube.com*, remarks, we now see more issues and conflicts related to digital fake news impacting mainstream society; fake news is a term for the false distribution of 'yellow journalism' intended to mislead, coerce, influence or sensationalize user opinion [42]. It can arise online because the decentralized, supranational nature of the Web enables individual actors to make use of what are essentially unregulated networks to 'cast' themselves, through engaging content, with a sense of authenticity, perceived accountability and so become a counter-cultural focal point, which echoes concepts by Dahrendorf regarding the use of capital to gain influence [40; 42]. HTML, HTTP, and URLs are fantastically open protocols but their nature, that nobody owns them and so anybody can start a website, for example, ensures the potential for misuse. This is increasingly possible because actors engaged as alternative influences can affirm their own ideological content, which has the potential to radicalize audiences over longer enrollment in their networks.

Problematically, the 'amusing' appeal of fake news and alternative influencing media masks the often vulnerable and dangerous ideologies that news with intentionally false information can create; it influences behavior and decision making within the Web that is far from pro-human, so can shape public opinion accordingly. Indeed, studies have suggested that not only is fake news deeply effective of public opinion, but many users of the Web often fail to differentiate it as false, perhaps due to a lack of critical thinking, or digital media literacy education, when presented with information they take as universally accurate, because it is displayed online and often is presented in a format that is deeply convincing and educational interventions by groups such as the United Nations Educational, Scientific and Cultural Organisation haven't quite realized the global empowerment intended [43; 44]. This is a problem, because as Shearer & Gottfried in their *Pew Research Center Report: News Use Across Social Media Platforms 2017* indicates, as of August 2017 two-thirds (67%) of Americans report they get at least some of their news on social media, with two-in-ten doing so often [45]. In particular, the report indicates that older citizens, who lack more formal digital literacy education than those immersed in the Web from an early age, are increasingly turning to social media for news, whilst those who have not engaged in a bachelor's degree-level education are doing the same; their counterparts, degree graduates, are declining in their use of social media for news [45].

In Thailand, this realization becomes more problematic, given the overall lower levels of educational provision that, despite a series of reforms, is still developing, especially in the drive towards improving higher education, rurally located training for teachers in dispersed villages, professional development opportunities and, most notably, a well-defined ICT skill development and education policy, as concluded by a 2015 OECD-UNESCO report entitled *Education in Thailand* [54]. Thailand 4.0 is one initiative that goes some way to improve the status quo but will require a united effort from the Thai HE community engaged in communications research, to ensure we design educational interventions to equip students, who are the future decision-makers and potential leaders within our

shared society, to make critical decisions about content, information and news they engage with online, especially given the rise of complex and convincing fake news and disinformation [45]. After all, estimates place the users of Facebook.com alone in Thailand at 49,000,000, nearly 72% of the entire population [46; 47].

This places Thailand's social media users, at least for Facebook.com, in the top-10 globally. It's no surprise that the Thai Minister of Digital Economy and Society announced, in the recent press, that the government would be launching an anti-fake news center that would be situated in Bangkok. This seeks to combat misreporting of disasters, social problems and financial news through teaching digital media literacy and provide a verifying tool for Thai citizens to upload, and report, what they suspect as unauthenticated news that could incite 'fear' and be informed, within two hours, of its veracity [48]. A great step forward to improving digital literacy education, led by the government, some critics within the liberally inclined Future Forward Party have contended the center's policies and powers could be misused to attack political opponents, despite assurances otherwise [48]. Ironically, only recently during the 2019 Thai elections, a key member of the Future Forward Party was accused of disseminating fake news and suggested as violating a provision of the law against online activity that endangers national security, embedded within the Thai Computer Crime Act [49].

Clearly, the complexity of fake news cannot be underestimated within SE Asia. As Kywa points out in a detailed 2019 ISEAS report entitled Facebook in Myanmar: From Hate Speech to Fake News to Partisan Political Communication there has been an increased link between fake news dissemination and the distribution of regional violence, conflict, and racism within Myanmar. Similarly, as Irawanto argues in a further 2019 ISEAS report Making It Personal: The Campaign Battle on Social Media in Indonesia's 2019 Presidential Election, that fake news plagued and convoluted public opinion and citizen understanding to such an extent it problematized the electoral decision-making process, judgments and decisions [50; 51]. However, much of the problem of fake news points to an imbalance between the knowledge and power of citizens to make informed decisions about the content posted as public opinion within social media. Whilst governmental bodies and others may make important steps to try and teach about digital literacy, the concept of digitality and literacy are far-reaching concepts with little consensus as to the extent of balance between one and the other. Rather, then, we need to be focusing on the importance of educational interventions that teach about the contextual meaning and critical thinking of the relationships and network negotiations, alignments and authentication processes that drive enrolment and participation online [2]. So, educating citizens to critically understand the whole phenomenon rather than just part of it, through just one disciplinary focus because, after all, fake news has implications to computer science, law, history, human rights, educational pedagogy and even geography, as we can hardly say it is just a problem facing one country.

Rather, fake news is a global phenomenon and one that cannot be curtailed just by laws in one nation-state; it requires an educational reformation to promote the types of critical thinking necessary to understand it and this comes from many different disciplines, in order to generate the sociotechnical capital necessary amongst users of the Web in Thailand to critically understand the terms of their

participation [3]. Undoubtedly, fake news is a technical actor; yet, it clearly has equal influence in driving social relationships, actions, and outcomes. Problematically, within SE Asia as a whole, the traditional emphasis on rote learning, memorization of facts emphasized at the repetitive direction of a teacher, rather than a critically engaged learning process where students engage in a methodology based on skills scaffolded against advancing independent reasoning skills, still pervades, even in Thailand and its educational institutes [53; 54].

4. #webscithai: Interdisciplinary Web Education

The Web has transformed global multicultural communication and introduced dynamic shifts in the power individuals can accrue through sharing their opinions, as data that is distributed publicly, but privately capitalized upon, online. This creates an economy and infrastructure that brings with it profound changes for global transformation, not least for younger and increasingly digitally native Thai citizens [2; 3]. No clearer example of this is than, upon writing, the arrest of Karn Pongpraphapan, a 25-year-old student who was charged under computer crime laws, for posting content alleged to stir hatred on Facebook.com [54]. The point, then, is not to question the legitimacy of the arrest or the laws that surround it and rather, we should instead, consider how we, as researchers in Thai HE, can work with both the government and its future decision-makers, our students, to shape the educational interventions needed to ensure students can express themselves in informed, safe and sensible ways, which comply with the on-the-ground realities of Thailand's laws. Given the relationship between such power and knowledge debates, it seems prudent to ensure that our curricula are developed to ensure a balanced, sociotechnical intervention [1; 2].

This is where Web Science is key [56]. We contend Thai HE requires, as argued in this paper, interdisciplinary science that supports in a pro-human way, a learning process capable of satisfying the complexity that surrounds the teaching of digital media literacy, communication and culture within Thai HE. For this reason, we put forward that the discipline of Web Science offers an important way forward to empower and enrich learning. Unlike their counterparts in the West, Thai students face more restrictions that impact their usage and, as a result, further extend the digital divide [2; 4]. As researchers and educators in Thailand, we have a profound responsibility; we seek to prepare future generations of Thai citizens to engage in a way that develops a pro-human Web and ensures their use of this Web protects any digital rights and responsibilities they are entitled to, whilst simultaneously protecting them from harm, imprisonment and arrest under communication violations [3].

As Professor Dame Wendy Hall et al. (p.4), contributors to the development of the Web and discipline of Web Science, notes the "...Web distorts public voices, amplifying some, silencing others... ways to dampen the hateful voices and encourage productive discussion clearly need to be found." [57]. This is certainly true of public opinion online and emphasizes why we need to be researching the relationship between such opinion and the Web. Meanwhile, as Professor Susan Halford and Professor Steffan Straub [58], prominent Web Scientists in their own right, aptly conclude in their recent paper *Web Science in Europe: Beyond Boundaries* that "...the vast majority of Web research is disciplinary. Web Science in Europe has been at the forefront of developing

interdisciplinary approaches to describing, analyzing and intervening in the Web. Our experience over the past decade shows that working across disciplines brings a depth of analysis and level of confidence in research outcomes that are much needed to address the very real challenges facing the Web-and society- as we move forward into the 21st century". We contend that Web Science is an important way to draw together disciplines in Thailand to study the Web and the opinions shared within it; in compliance with the new Thai government, rather than as activists against it. Web Science can do a lot to facilitate such a discussion.

But not if it stays at home in the West. We need to be thinking on Web Science beyond Europe, and America, given that emphasis on creating a science of the Web originated through the hard work of Professor Sir Tim Berners-Lee and the Massachusetts Institute of Technology (MIT) [56]. Moreover, we need to be examining how Web Science interdisciplinary concepts and core ideas can be applied in places where they can make a real difference, especially in a setting such as Thailand; Myanmar and Cambodia likewise have strong postcolonial histories tied to the West. This work begins by using Web Science to solve the digital inequalities and educational interventions needed in developing nations. So, working on the ground, asserting new ways to encourage students in SE Asia to safely, respectfully and legally, within the domicile, form-critical questions about the digital status quo and, by doing so, develop a more pro-human Web [3]. This same Web shapes the world and the world, those in it and their opinions, shape the Web. So, in Thailand, we need to teach the interdisciplinary skills needed to shape the pro-human society we want, one inseparable from the technical, in our global digital future [15].

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