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Working Toward Wisdom in IS Education: Developing an Integral Knowledge-to-Wisdom Teaching Framework

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ABSTRACT

The success of tertiary teaching depends much on teachers' approach to teaching. Although the suitability of university teachers is often measured by teachers' qualifications, publications in the relevant discipline, and teaching experience, a teacher's understanding of the nature of what is taught in the classroom may more significantly influence students' learning experience and future contribution to society. This commentary is based on Integral Theory, specifically the conceptualization of a wisdom meta-competencies model. We have developed an integral "knowledge-to-wisdom" teaching framework that proposes an integral set of pedagogical strategies for introducing wisdom-based teaching into Information Systems education. Implications of the study are presented as well as limitations and areas of future research.

Keywords: Knowledge, IS education, Integral theory, Reflection, Teaching framework, Wisdom

1. INTRODUCTION

We live in turbulent times. The events of the future will not necessarily reflect those of the past. Lessons learned from the past, ingrained habits, beliefs, ways of thinking, and even empirical knowledge, all rooted in socially and culturally specific time-space frameworks might fail us in managing future complexity (Intezari & Pauleen, 2017). Yet, even as we face an unpredictable future, one that would seem to require imagination, creativity, and wisdom to deal with, contemporary discourses in education have moved in the other direction, going so far as to criticize basing education around knowledge per se (Alderson, 2020; Lambert, 2018). Many prefer to see practical or skill-based employment-oriented education, particularly in business disciplines (Mintzberg, 2005), including Information Systems (IS).

While universities are encouraged to develop and strengthen connections linking knowledge with practice and academia with industry, we argue that the challenges societies face today, and will in the future, call for solutions that require more than just work skills and work-related knowledge (Bitzer, 2011; Maxwell, 2012). Rather, we need virtuous managers and practitioners (Potts, 2020). Universities should not be value-free education providers (Mitroff, 2004) neglecting the ethical aspect of the business world (Berti et al., 2020).

Dalal and Pauleen (2018, p. 225) argue for including wisdom aspects in IS research, teaching, and practice to "create new opportunities for IS by providing fresh perspectives for IS to discover, develop, design, understand, and address technology issues of critical relevance to individuals, organizations, and society." They point to IS-related issues pertaining to ethics, privacy, and surveillance, and urge educators to guide students in building wiser relationships with technology. Technologies and situations that would specifically benefit from a wisdom perspective, they suggest, include decision support systems, systems thinking, project management, modeling, analytics, requirement analysis, human-computer interaction, and probing philosophical questions around the development and use of artificial intelligence.

We maintain that wisdom-based educational practices are needed to support the IS profession. It is critical that students learn not only knowledge and skills, but also understand the role of wisdom in designing and using information systems as many of the solutions to the grand challenges of our time, from health to education and sustainability, depend deeply on information systems (Burton-Jones et al., 2021). Future IS work will call for professionals with wisdom-based worldviews, professionals who understand how IS relates to human eudaimonia, and how their role in society affects their approach to the design and use of IS.

However, is wisdom innate or can it be learned? While early definitions of wisdom are mainly concerned with personality traits and the use of knowledge (Ardelt, 2000; Staudinger et al., 1992; Sternberg, 1985), recent approaches treat wisdom as a contextually and culturally bound reasoning ability (Grossmann et al., 2012). In this paper, we argue that wisdom is a complex phenomenon that engages multiple capacities and competencies and manifests itself in the practice of decision-making and taking action in uncertain and socially complex situations. While early and contemporary approaches to wisdom have provided valuable insight into the nature and conceptualization of wisdom, less attention has been paid to wisdom development through educational systems.

In this commentary, based on Integral Theory (afterwards in lower case), we conceptualize a wisdom meta-competencies model and propose an integral teaching framework. This approach assumes that much IS education is primarily knowledge-based, though increasingly evolving or being pressured into practice or skill-based education.

In the next section, we detail the literature on information, knowledge, and wisdom as related to business studies teaching and learning in general and IS in particular. We then introduce the relevant literature on integral theory and the wisdom meta-competencies model (WMC), which underpin the integral knowledge-to-wisdom teaching framework. We conclude with implications, limitations, and recommendations for further research.

2. THEORETICAL AND CONCEPTUAL UNDERPINNINGS

2.1 Information, Knowledge, Wisdom, and Education

To get a handle on the content of academic teaching across disciplines, but particularly as related to business and IS education, and to link it with both the wisdom meta-competencies model (WMC – explained in detail in Section 2.2.1) and integral theory, we have chosen to classify content into three well-known albeit generic categories. These categories correlate with the levels of the WMC model introduced next. Although these concepts are generic, they are widely modeled in the wider business discipline, particularly information-based fields. Even so, these concepts are not necessarily well understood and differentiated from one another (Van Meter, 2020).

In the information-based (IT, IS, MIS, etc.) disciplines, the hierarchical data–information–knowledge (DIK) approach is "taken-for-granted" (Rowley, 2007). This is also often the case in management and organizational literature (Intezari & Pauleen, 2019). In the DIK approach, knowledge is believed to derive from information and data (Davenport & Prusak, 1998). Being an interdisciplinary concept sitting between data and knowledge, the meaning of information has been the topic of both modern and post-modern discourse (Capurro & Hjørland, 2003). In this article, we refer to a definition that is widely used in the IS discipline—that information is the analyzed and/or contextualized form of data, and it becomes knowledge once it has been combined with an individual's experience (Alwis & Hartmann, 2008).

This paradigmatic DIK pyramid has entered the public consciousness, where often-used concepts such as "big data," "information society," and "knowledge workers" abound. "Information" has become ubiquitous in our world. We live in an information society in which vast amounts of data/information are generated daily, and it has become the *de facto* basis for an array of organizational and government decision-making. University teaching and administration have also come to rely heavily on data and information to develop pedagogies and set policies.

Figure 1 depicts the WMC model which consists of four levels. The first level, Collection, represents the DIK pyramid and is associated with the conventional knowledge-based teaching approach. The other three levels include the levels of cognition, connection, and conduct, which address different aspects of wisdom-based teaching. Each level builds upon and complements the level below. We will further explain the model in Section 2.2.1.

While information and knowledge are associated with accumulating facts and functionality, wisdom engages analysis and synthesis as well as employing judgment and taking appropriate action. Bierly et al. (2000) stress that the interactions between and among data, information, knowledge, and wisdom engage different learning processes, hence the need for integral approaches. Wisdom has not been given much attention in the knowledge-based teaching system (Intezari & Pauleen, 2013).

Knowledge-based teaching is mainly aimed at transferring accumulated data, information, and knowledge. In knowledge-based teaching, students learn to effectively gather, analyze, and synthesize data and information, to apply knowledge in practice, and to develop "new" knowledge. Wisdom-based teaching, on the other hand, integrates considerations of ethics, stakeholders' values and interests, emotion, insight, and the awareness of the fallibility of knowledge, as well as the desire and ability to see what is of value in life (Bierly et al., 2000; Maxwell, 1984; Sternberg, 2004; Tredget, 2010).

2.1.1 The Limits of Knowledge. Whether as technical rationality or human discourse, knowledge does not extend beyond humans' predictive capacity (Intezari & Pauleen, 2019). It is accumulated, evolves, and is reformed and tailored over time for either current or foreseeable contingencies. If we accept that providing a precise picture of the future is impossible in practice, even if we used cutting-edge technologies and scientific studies of past and current trends (Uhl-Bien & Marion, 2008), we should admit that the future will always encompass emergent phenomena and surprising situations (Intezari & Pauleen, 2019). This shadow side of the future is where our knowledge is most likely to fall short (Intezari & Pauleen, 2014) and where unwise or dis-integrated responses can have unanticipated, even harmful, consequences (Rooney et al., 2010).

The constituent elements of knowledge (e.g., data) may be universal in meaning but this does not mean that they will be universally applicable in the future (Intezari & Pauleen, 2017). For example, information that has been gathered by a particular business in the past few years, while still possessing the same meaning as before, may not be useful in future situations. This can also be true for the information and knowledge taught in the classroom.

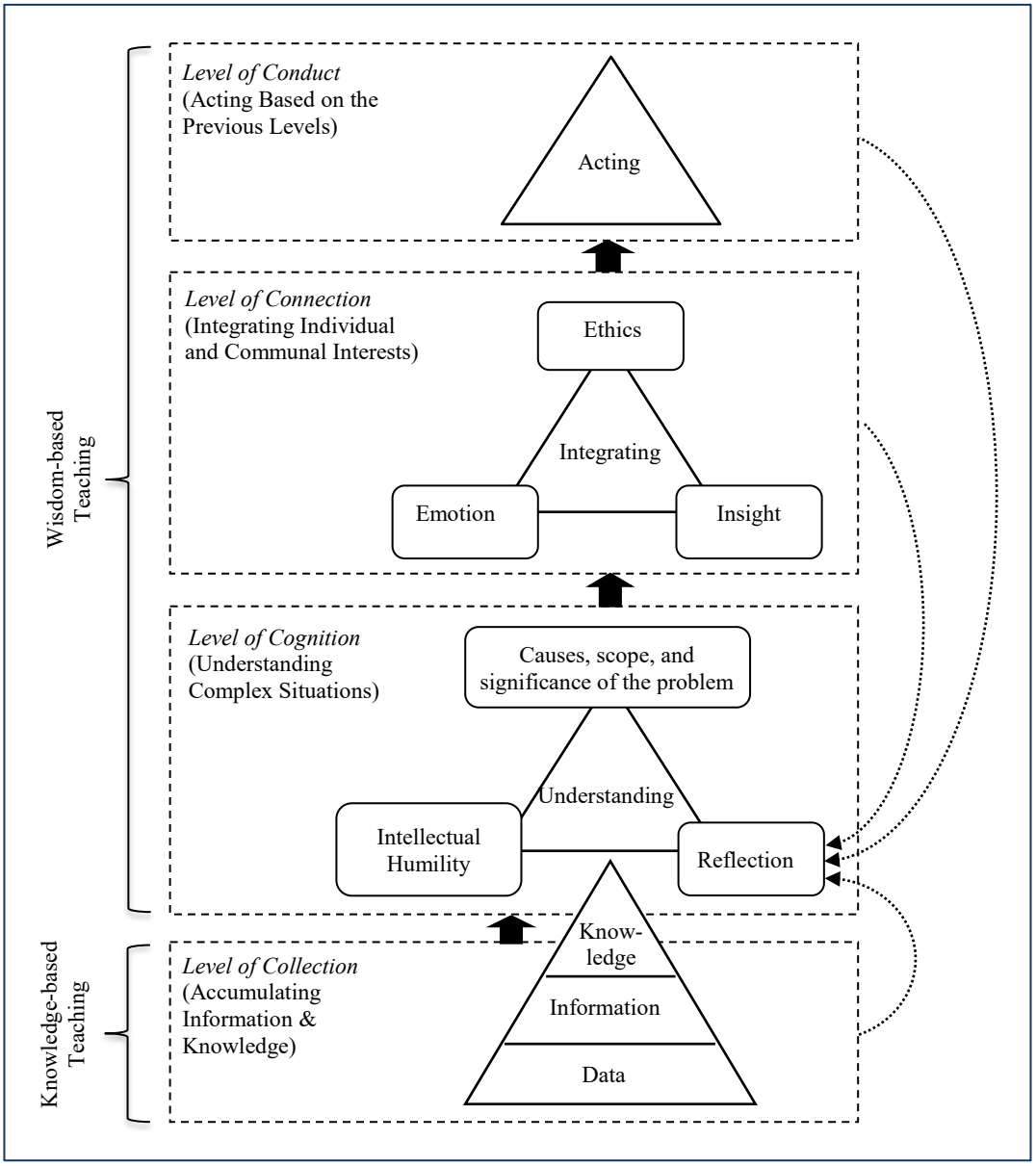

Figure 1. Wisdom Meta-Competencies (WMC) Model (Intezari & Pauleen, 2013)

Accordingly, business and IS courses and programs that concentrate on the accumulation and dissemination of knowledge and information may not be preparing students for situations where there is limited similarity to the past. This inherent limitation may be overcome by *wisdom's meta-competencies* that complement and enhance knowledge (Intezari & Pauleen, 2013). Maxwell (1984, p. 65) declares that "the philosophy of wisdom is designed to overcome the fundamental and profoundly damaging defects of rationality inherent in the philosophy of knowledge." Others, e.g., Rooney (2013), have suggested that epistemology must be replaced with a wisdom-based *phronesiology*, in which education results in both knowledge and wisdom for the student and in more socially beneficial outcomes (Intezari et al., 2016).

It is, arguably, necessary that wisdom meta-competencies be taught to students so that they can apply them in evaluating complex real-world situations (Small, 2004), particularly in a world where sustainability and social responsibility are becoming more important foundations for action. The accumulation of knowledge on its own does not necessarily create a better world (Pinheiro et al., 2012). Over-emphasis on the epistemological implications of knowledge in the educational system can lead to under-realization of the potential value of education to foster wise outcomes (Maxwell, 1984).

2.1.2 Developing Practical Wisdom in the Classroom. Practical wisdom concerns the ability to think about how one should act in any particular situation to contribute to human

flourishing and the fulfillment of a good life (Shotter & Tsoukas, 2014). Shotter and Tsoukas (2014) argue that such ability is more than just an intellectual virtue because it requires moral virtue, which cannot be acquired merely by gaining knowledge.

According to Aristotle, "practical" wisdom can be taught. In *The Nicomachean Ethics*, Aristotle argues that the exercise of practical wisdom involves one's knowledge and awareness of right values and of what is good for human beings, as well as one's ability to apply that knowledge. Aristotle (1984, *Nicomachean Ethics*, 1103a, 15-30) further argues that virtues are acquired and developed through exercising them and habituation: a kind of "practice makes perfect." The result of practice is a habitus—a system of engrained dispositions formed by an inventory of pre-shaped, often pre-cognitive responses which can synchronize and give direction to our feeling, thinking, and acting (Rooney et al., 2021). Practical wisdom can be embodied as habitus (Rooney et al., 2021).

Success in coping with complexity and in living well requires teaching that concentrates on knowledge, wisdom meta-competencies, ethics, and practice, rather than just knowledge. Accumulating information does not equate to the cultivation of wisdom (Ardelt, 2000). Sternberg (2001) argues that while intelligence-related skills are important, they do not provide sufficient basis for education. Students should not only be able to use their individual abilities to maximize their attainments, but also to use their intelligence-related skills and individual abilities to maximize the attainments of others (Sternberg, 2001). The development of wisdom requires developing reflective thinking, contemplation about the meaning of life, and the quest for fulfillment (Ardelt, 2000). Sternberg (2001) asserts that our current educational systems are not prepared for, and do not nurture, wisdom. Perhaps a paradigm shift is necessary to help students understand the ways in which wisdom can improve humans' relationship with technology (Dalal & Pauleen, 2018).

In the realm of business and IS education, however, teaching such meta-competencies, even just ethics, has not been given much focus in the classroom. Shotter and Tsoukas (2014) assert that what stops both practitioners and scholars from properly considering and implementing the vital aspects (such as moral agency and emotions) of the hermeneutical and developmental process of practical wisdom is the dominance of the "rationality" orientation. While there have been ways of teaching proposed for some of the meta-competencies, e.g., reflection, others, such as insight, are not given much attention. Teaching these meta-competencies (e.g., insight) needs to be studied further.

2.2 Integral Theory and the Wisdom Meta-Competencies Model

This commentary is rooted in Wilber's (2000a, 2000b) work on integral theory, which guides the revision of the WMC and the development of the Knowledge-to-Wisdom teaching framework. These are introduced in the following section.

Wilber's (1995, 2000a, 2000b) integral theory originated in psychology. However, it has been applied in many contexts where knowledge building, communication, and decision-making are central concerns, including education, leadership, organizations, and business (Esbjörn-Hargens, 2010; Landrum & Gardner, 2005; Murray, 2008). One function of the integral approach is to provide a comprehensive model that includes various progressive methods (Murray, 2009).

Dealing with unique and emergent phenomena effectively at a given time depends on one's ability to apply an overarching integrative approach to the decision or action-taking situation. Such an approach involves an accurate understanding of self, intellectual humility, a self-transcendent viewpoint, and understanding situational contingencies and the problem at hand (Grossmann et al., 2012; Intezari & Pauleen, 2018). Integral approaches to education allow for a variety of ways of knowing and being (Esbjörn-Hargens, 2010). Murray (2009, p. 31) suggests that "integral" is an aspect of human capacity, and defines it as "a form of human understanding and skillfulness that takes the insights about the human condition, […] adds new levels of rigor, reflective self-and-system understanding, and hope to the possibilities of improving the human condition." This integral capacity encompasses many of the qualities and characteristics of wisdom as understood in recent management literature (Intezari & Pauleen, 2019). As Murray (2009) states, with regard to education, an integral approach helps one transfer their wisdom to others.

Using integral theory, we can gain a better understanding of the role of teachers in the classroom, as it not only provides a new set of beliefs about teaching and learning, but also deals with and shows new ways of being in the classroom, and indicates how to make sense of the educational process (Murray, 2009). The wisdom meta-competencies model introduced in the following section captures many of these qualities of integral education and theory.

2.2.1 Wisdom Meta-Competencies Model. The WMC model (Figure 1), based on the work of Intezari and Pauleen (2013), illustrates a systematic approach to integrating wisdom meta-competencies in IS pedagogy: in this case, the teaching of wise conduct in the challenges of professional and daily life. According to the model, one's ability to act effectively and appropriately in dealing with challenges depends not only on accumulated knowledge related to the situation (as well as the ability to find and share information) (Level of Collection), but also on an understanding of the causes, scope, and significance of the situational contingencies (Level of Cognition). The level of Collection represents the data–information–knowledge (DIK) pyramid approach, which these days forms the basis of much information-based education (Gilbert, 2005; Rowley, 2000; Starkey, 2011).

The first two levels in the WMC model imply that wisdom is more than accumulated knowledge. Wise people not only possess knowledge, but also use the intellectual insight and moral virtues to ethically and effectively apply it (Bierly et al., 2000; Rooney & McKenna, 2005). "Understanding" is primarily created from knowledge and can be deepened by refining one's knowledge through reflection (Kinsella, 2011). This is based upon the proposition that intellectual humility is vital for one to become wise (Grossmann et al., 2016).

Research from psychology shows that people are often overconfident about their knowledge (Mannes & Moore, 2013). Empirical findings suggest that experience and overconfidence have opposite effects on decision-making, with overconfidence leading to more irrational and ill-thought-through decisions (Hafner-Burton et al., 2013). Lin and Bier (2008) found that experts tend to have overconfidence in their domain-relevant estimates. Given the paradox that experienced people who

enjoy more confidence in making decisions may be overconfident (Hafner-Burton et al., 2013), intellectual humility can play a significant role in moderating overconfidence and improving one's decision quality. Intellectual humility may be even more important for new learners at university, who might never have performed a task related to what they have learned. In six experimental studies, Sanchez and Dunning (2018) found that beginners are highly prone to overconfidence, as they quickly come to the belief that they know much (if not everything) about what they are learning. The on-going dilemma of competence and experience vs. overconfidence and hubris was well articulated in Mintzberg's (2004) book *Managers, Not MBAs*.

Wise people are always aware of the limitations of their knowledge and information (Baltes & Kunzmann, 2004) and therefore balance certitude and doubt, enabling them to benefit from past mistakes through evaluative and reflective skills (Sternberg, 1985). They continuously monitor situational contingencies to understand the causes, scope, and significance of the challenges at hand. Such continuous monitoring enhances the wise person's intellectual humility. Reflection is also correlated with the levels of Collection, Connection, and Conduct. To take wise action, one needs to reflect on one's other competencies as well as the consequences of actions.

At the Cognition level, one is able to identify and articulate a problem and formulate alternative solutions. The Cognition level engages an understanding of the causes, scope, and significance of the problem, as well as the considered consequences of available solutions. This level complements the level of Collection as the processes involved in making sense of data and information are cognitive (Badia, 2013).

Once the problem is identified, a wise person goes beyond simple rational reasoning to try to merge individual and communal interests based on an integration of rational and non-rational (e.g., emotional) cognition along with ethical considerations (level of Connection). People with higher emotional regulation show more empathy and therefore better understanding of the possible impact of their decisions and actions on others. There is a positive association between one's ability to manage one's emotions and one's engagement in morally desirable actions and prosocial behaviors (Laghi et al., 2018) by enabling one to understand others and affectively respond to others' emotions (i.e., empathy) (Thompson et al., 2019).

The first three levels lead to effective and wise actions by wise means at the level of Conduct. Action based on the insight gained from the previous three levels can be understood as a form of system awareness or systems intelligence. As Jones et al. (2011, p. 81) explain, people with systems intelligence "have an intuitive ability to operate effectively within systems, and that highly systems intelligent people are able to instigate systematic change." Systems intelligence spurs one's problem-solving capability by combining one's insight about the relevant interconnected phenomena with a pragmatic orientation of life (Hämäläinen & Saarinen, 2008). Insight is critical for developing one's wisdom (Intezari & Pauleen, 2013). Insight operates primarily at the level of Connection and refers to one's understanding of the functional relationships between components and different aspects of a specific situation in a particular way (Marková, 2005). "Insight enables one to comprehend the obscure aspects of situations and events, recognize their interrelationships, and gain a true, deeper and wider understanding of the bigger picture and of the dynamics taking place" (Intezari & Pauleen, 2013, p. 161).

3. DISCUSSION – DEVELOPING AN INTEGRAL KNOWLEDGE-TO-WISDOM TEACHING FRAMEWORK

Based on integral theory, the WMC model, and the relevant literature, we have developed a framework (Table 1) that describes teaching strategies that can be adapted for IS education. In this knowledge-to-wisdom teaching framework, we suggest methods for the integrated and progressive teaching of information, knowledge, and wisdom. The pedagogy involves three elements or steps, which aim to allow a variety of ways of knowing and being (Esbjörn-Hargens, 2010) and which "adds new levels of rigor, reflective self-and-system understanding, and hope to the possibilities of improving the human condition" (Murray, 2009, p. 31).

1) Understanding the relationship between information and knowledge, and using knowledge to collect, value, synthesize, and apply information. This understanding and these skills are taught in knowledge-focused teaching (level of Collection) about data, information, and knowledge.

2) Building knowledge and using it effectively. Knowledge includes both intellectual knowledge and dialectic knowledge that are required for dealing with a particular context in daily/professional life and also for understanding the meaning of life (Ardelt, 2000). According to Sternberg (2004), wisdom is rooted in one's implicit knowledge. This means that accumulating knowledge through formal and informal education mechanisms, as well as through personal and professional experiences, is fundamental to fostering wisdom. These ways of understanding and using knowledge are taught in knowledge-focused teaching (level of Collection) about knowledge and further developed in wisdom-focused teaching (level of Cognition) about knowledge and reflection.

3) Developing wisdom meta-competencies. Zhu et al. (2015, p. 610) define wisdom as "a virtuous and appropriate-for-the-situation bundle of competencies." Wisdom is concerned with how one can deal with their limited knowledge, balancing knowledge and doubt (Staudinger, 2008) to solve a problem at hand by coordinating thought, motivation, and emotion (Baltes & Staudinger, 2000). These lessons in developing wisdom competencies begin in wisdom-focused teaching (level of Cognition) about reflection and intellectual humility and are further developed in wisdom-focused teaching (levels of Connection and Conduct).

The wisdom meta-competencies are closely integrated, and therefore the teaching strategies are applicable across multiple competencies. For example, strategies for teaching individual and communal interests can facilitate or be applied along with the strategies that are used for teaching ethics. Similarly, teaching ethics without considering the role of emotion and compassion in an individual's decisions is almost impossible. As Zhu et al. (2015) show, aligned with a moral psychological approach, wisdom is concerned with virtues, reason, and compassion. In this sense, wisdom engages "Emotional Awareness" and "Individual and Communal Interests" as well as the level of Cognition.

Teaching Orientation	**Levels**	**Competencies**	**Definition of the Competencies (indicative)**	**Teaching Strategies and Techniques (examples)**
Knowledge-focused Teaching	Level of Collection	Data	A set of discrete, objective facts (Davenport & Prusak 1998) that construct the "factual content of information" (Melkas & Harmaakorpi, 2008, p. 108).	Teach: knowledge needed to engage in data and information search, retrieval, and management; basic computational skills. This competency can be developed through individual, group, or class activities such as searching the internet for factual data about a subject matter. Examples are the numbers or percentages about a specific topic (e.g., cyber-security attacks in a specific period of time in a country).
		Information	Processed data in a meaningful context (Lillrank, 2003).	Teach: knowledge needed to engage in data and information verification, analysis, and presentation; competencies required to interpret data reports and visualizations. Case Example of teaching practices: Interpreting the data about the cyber-security attack; What different pieces of data are interrelated and what they mean in relation to each other; Are the data factual data, or opinionated/biased? Students should be able to explain and show how they have verified the information, i.e., did they check the validity and relevance of the sources of the information? Are the data factual data reported by academic journals, consultancy reports, professional magazines, or government documents? Students can be asked to summarize and present the information to the class. Can the students differentiate fact-based information from opinionated or subjective expressions? Students can be asked to provide examples of each type of information (e.g., opinionated vs. factual).
		Knowledge	Ability to interpret and apply information and experience in a particular context (Harris, 2005; Nonaka, 1994). Intellectual knowledge, which is a mastery of changing the outside world (Ardelt, 2000).	Teach: knowledge needed to synthesize information and experience to solve problems; how to apply pre-developed frameworks to problem solving and decision-making, e.g., project management strategies, eight steps to making a decision, etc. This knowledge can be obtained through scientific, objective, and theoretical approaches (Ardelt, 2000; Strijbos, 1995). Case: Ask students to explain, for example, how the cyber-attacks can be identified at the individual or organizational levels. Students should be able to find information (frameworks, or protocols) that provides guidelines to avoid cyber-attacks or manage any cyber-attack incidents. Case studies that require students to apply the frameworks and protocols to identify and manage a

				cyber-attack.
Wisdom-focused Teaching	Level of Cognition (understanding complex situations)	Knowledge	Dialectic thinking, beyond formal operational thought (Ardelt, 2000). Wisdom-related knowledge, which is concerned with search for truth, search for the meaning of life. It is a mastery of changing the inside world (Ardelt, 2000). This knowledge engages reflection and acting. Wisdom drives purposeful actions (Zhu et al., 2015).	Teach: various ways of knowing, e.g., logic; critical thinking; non-rational knowing (e.g., developing intuitive skills); body awareness; culture-specific forms of knowing; research methods and skills; techniques for developing a life-span action plan based on the knowledge that accumulates through formal and or informal systems (as well as daily and professional experience), guiding students for a good life in the future. Case: Ask students to argue for or against the suitability and effectiveness of the cyber-security and protocols in relation to a cyber-security case study.
		Reflection	"Learning and developing through examining what we think happened on any occasion, and how we think others perceived the event and us, opening our practice to scrutiny by others, and studying data and texts from the wider sphere" (Bolton, 2010, p. 13).	Teach: the techniques that help students refine their understandings of self and their surroundings, including political, social, and environmental contexts; require "close attention upon one's own actions, thoughts, feelings, values, identity, and their effect upon others, situations, and professional and social structures" (Bolton, 2010, p. 14); encourage dialogue with oneself as to the moral, ethical, social, cultural, and political implications and consequences of one's practice (Larrivee, 2008). Case: Encourage students to apply and then compare and contrast different frameworks and protocols. Provide students with two sets of protocols: one ineffective and one effective. The effectiveness or relevance of the protocols must be blind. Ask students to apply the protocols sequentially. At the end of the activity, the students should identify the ineffective set of protocols and explain why the protocols were likely to fail to mitigate or handle the cyber-attack in the scenario. They should reflect on the effectiveness of the second set of protocols too.
		Intellectual humility	"Recognizing that a particular personal belief may be fallible, accompanied by an appropriate attentiveness to limitations in the evidentiary basis of that belief and to one's own limitations in obtaining and evaluating relevant information" (Leary et al., 2017). Note: Sanchez and Dunning (2018, p. 26) suggest that a resolution to a beginning learner's proneness to knowledge overconfidence might be in the philosopher, Collingwood's, observation	Teach: how to challenge assumptions about self and expectations for self and wider society; that competence is linked to self-awareness and reflection, as intellectual humility requires one to understand the assumptions and premises underlying beliefs (given that beliefs direct behaviors); case studies where the initial and most obvious solutions are not the right ones; case studies that represent decision failures arising from exclusively relying on current knowledge and experience. Case: Provide students with a set of information about possible solutions to a decision-making scenario, where students are required to manage a cyber-security incident at their organization.

			that "people cease to be beginners in any craft or science, and become instead masters, at the moment they realize they are going to be beginners for the rest of their lives."	Instruct students to apply what they have learnt from the provided information and solutions to the case study. Then replace the scenario with a similar yet secretly complex one (or unfold different layers of the first scenario to add more complexity to the initial scenario). The complexity of the scenario should increase to the point that what students have already learned (and think is applicable to any situation) falls short in addressing the issue in the case study. Have a list of solutions (hidden from students) organized from less to more effective. Reveal the solutions one by one. Let students try the less effective solutions before revealing a more effective solution.
	Level of Connection (Integrating individual and communal interests)	Insight	The understanding one obtains of the functional relationships between component parts of a specific situation in a particular way (Marková, 2005). "The awareness and deep understanding, concerning one's own condition(s) in a particular situation at a given time; as well as the capacity to explore possible meaningful relationships between apparently unrelated events and phenomena pertinent to that situation" (Intezari & Pauleen, 2013, p. 160). Systems Intelligence: "a capacity in the human being that involves instinctual, intuitive, tacit, subconscious and unconscious and inarticulate aspects that cannot be straightforwardly reduced to a full-fledged and transparent cognitive dimension" (Hämäläinen and Saarinen, 2004, p. 16).	Teach: cases that require students to assess situations by comparing different perspectives and weighing each perspective, based on clear and explicit criteria. Such practices can help students to see how they interpret the situation and compare/contrast different alternatives. Encourage: students to seek out all related features in a given situation, in order to ensure all relevant aspects are considered. Teach and practice specific techniques that generate or develop personal insight, such as insight meditation (Klein, 2015): a) forming connections, b) identifying contradictions and inconsistencies, and c) discovering assumptions or detecting leverage points not appreciated before. "Insight Stance" to boost insights by encouraging students to adopt a stance or mind-set that is driven by curiosity rather than a fear of getting a wrong answer (Klein, 2015). Case: Use a complex cyber-attack scenario, where a public organization's database is affected, and the personal information of a very small number of citizens has leaked. Explain the butterfly effect (the chaos theory) and ask students to identify as many stakeholders as possible who may be potentially affected by the cyber-attack.
		Emotional Awareness	The ability to recognize emotions as they emerge in self and others and to strike a balance between being overly affected by them or ignoring them when making decisions and taking actions.	Teach: practices that develop and encourage the ability to become aware of one's own and other's emotions and the role they play in decision-making and action taking. For example: mindfulness practice; meditation; "Emotions Faces" game developed by Lynn (2007). Case: Ask students to come up with one purely rational and one purely emotional reaction of a CEO to a cyber-security incident. Then instruct students to

				compare their responses with other students' in the class and reflect on the responses. What do emotional/rational reactions look like in response to the incident? Which reaction is more effective and why? Ask students how their reactions would have changed if they were one of the clients who had been affected by the cyber-security attack? What would be their expectations of the CEO?
		Ethics	"Having to do with what is right, good, and/or virtuous" (Tjeltveit, 2000, p. 243).	Teach: cross-cultural ethics and philosophy; consideration and awareness of wider society and stakeholders' values and beliefs in decision-making and before action taking. Practice: reflection and habituation of ethical considerations (Rooney et al., 2021). Case: Provide students with the details of some hypothetical or real businesses/organizations. Then ask students to identify the possibilities that business information systems in that business/organization create for unethical behavior. For example, students can be asked about what phases of a CRM (customer relationship management) system may be susceptible to unethical behaviors. Similarly, students can be instructed to explain the most ethical and unethical behaviors in the handling a cyber-security attack where customers' personal information has leaked.
		Individual & Communal Interests	Going beyond self-interest to consideration of individual and communal interests. Understanding how the consequences of one's decisions and behaviors may affect oneself and others over the short and long term. A wise person actively tries to enhance the community (Sellman, 2012).	Develop: students' competencies to see phenomena through a multi-leveled approach (Hays, 2013). Teach: students to manage both their own belief systems and the belief systems of others and how these can be integrated and harmonized (Hämäläinen & Saarinen, 2004). Case: Use a real cyber-security incident reported in the news or social media. Ask students to explain how individuals, the organization affected by the attack, and wider society (could) have been negatively affected by the incident. What would students do to protect both individual and communal interests in that incident if the students were the CEO in the organization or if they were the leader of the crisis management taskforce handling the incident?
	Level of Conduct	Acting	Taking proper actions and doing things right. Integrating three factors (Intezari & Pauleen, 2013): Effectiveness of the action; Interpretation of the situation; Ethics – the degree to which individual	Teach and practice the embodiment and habitus of wisdom and ethical behavior (Rooney et al., 2021; 2010; Küpers & Pauleen, 2015). For example, creating embedded "Learning Space/Work Space" (Meyer, 2009), performative and creative wisdom learning (De Monthoux

			and social values and interests are considered.	& Statler, 2008). Practice bodily exercises and awareness – "mind, body, heart, and soul approaches" – and mindfulness practice (e.g., Leonard & Murphy, 2005), breathing exercises, Tai Chi, yoga, Aikido (e.g., Clawson & Doner, 1996). Pedagogy involving level of Conduct might include internships in which students observe, record, and reflect on their own behavior in a work environment. If internships are not available then students may do the same in the context of their university life, including group work on assignments. Case: Students can write (and post on their social media accounts such as Twitter or any other wide-reaching platforms as appropriate) impartial and unbiased reflective comments on both the pro- and anti-state perspectives on how the government imposes rules on national cyber-security in conjunction with individuals' privacy and data ownership. Students' performance can be assessed based on their level of impartiality, and critical thinking in both writing the reflective post and handling others' replies to the post.

Table 1. Knowledge-to-Wisdom Teaching Framework and Techniques

Moreover, while the levels (Collection, Cognition, Connection, and Conduct) in the WMC model are presented as phases, the teaching strategies suggested in the knowledge-to-wisdom teaching framework do not have to be taught one after the other. That is, a teacher may use different strategies at the same time. For instance, the strategies that are suggested for teaching "emotional awareness" do not need to be necessarily preceded by the teaching strategies that are used for "insight."

This Knowledge-to-Wisdom Teaching Framework is necessarily only indicative of the teaching techniques and strategies that are available to educators who wish to teach wisdom and wisdom meta-competencies in an integral fashion. There are many techniques, exercises, and strategies and more yet to be developed.

The barriers to developing wisdom-based education are many. These include significant institutional and societal constraints, as well as our own, as educators, limitations in understanding and practicing wisdom and wisdom-based teaching. Arguably, some of these barriers seem insurmountable; nevertheless, teachers can and do make efforts to bring wisdom into the classroom.

4. CONCLUSIONS AND IMPLICATIONS

Studies show that "[…] executives that fail – financially as well as morally – rarely do so from a lack of expertise. Rather, they fail because they lack interpersonal skills and practical wisdom" (Bennis & O'Toole, 2005, p. 17). Mumford et al. (2017) identify wisdom and the application of new ideas as a crucial skill for leaders who strive to address leadership problems. Intezari and Pauleen (2018) report that failure in most leader-led strategic decisions is rooted in a lack of wisdom aspects such as consideration of stakeholders' perspectives, future-thinking, self and other awareness, as well as reflection. Teaching wisdom to students, our future leaders, requires a paradigm shift in education so that phronesis is addressed in the classrooms (Rocha & Pinheiro, 2021).

In this paper, we have used integral theory to guide the development of a wisdom-meta-competencies model and instantiate an example of a framework for the integrated teaching of information, knowledge, and wisdom.

Recent work in wisdom and integral theory points to the importance of wisely using information and knowledge in decision-making and action-taking (Intezari & Pauleen, 2013). Benefits include less biased decisions (Brienza et al., 2018), more open, balanced decision-making, and contextualized thinking (Dunnavant & Levitt, 2015). Integral Theory has identified the importance of insight, reflection, ethics, emotions, and individual and community interests in the decision-making and action-taking processes, and we have sought to incorporate these elements into the Knowledge-to-Wisdom teaching framework.

This paper addresses the "so what?" question by providing a conceptual foundation for the consolidation of an IS pedagogical theory based on recent empirical studies in the field of wisdom. This study suggests practical guidelines for connecting wisdom and integral theory into IS education. This study broadens and deepens our view of the practicability of incorporating wisdom into university education. Practical wisdom is linked with decision-making and action-taking

concerning the important matters in life (Staudinger, 2008) and therefore is relevant in a management curriculum (McKenna, 2013). Wisdom is about learning and increasing the capacity to learn (Hays, 2010). Developing wise action-taking abilities must be part of a practical and reflective learning approach that enhances one's awareness, ability to integrate cognition and emotion, and simultaneously to see professional, personal, and social interests.

We argue that, while education is an iterative process of practice and reflection, at a deeper level, education can be understood as the integration of cognition-emotion and professional-social interests. Previous studies show that empathy comprises both affective and cognitive properties (Demetriou, 2018). To train students to fulfill their wisdom capacity in designing and using IS, ethics must become increasingly entwined in the tertiary curriculum and teaching model. Empirical studies show that "wisdom is promoted by avoiding exclusively adversarial learning models, engaging in training via lived experience in clinics, mentoring, and self- and cultural-reflection to develop contextualized thinking" (Dunnavant & Levitt, 2015). Habituation can lead people to learn moral virtues as "by learning to take pleasure in acting bravely [as an example of moral virtues], one eventually develops the ability to act rightly with proper feeling: one learns to be brave" (Jacobson, 2005, p. 392).

5. LIMITATIONS AND FUTURE RESEARCH

This paper is conceptual. In-depth qualitative research as well as global surveys of academics would provide an enhanced picture of the issues teachers face regarding the content they are teaching and the reasons for doing so. A global survey would also be useful in identifying strategies, techniques, and exercises to teach wisdom and enhance the knowledge-to-wisdom teaching framework, which is currently only indicative of ways to teach wisdom. Such a survey would also provide insight into possible variances in wisdom learning due to cultural differences.

Teaching constraints or barriers to incorporating integral wise practice into teaching will need to be studied further and addressed before wisdom-based teaching can be successfully implemented. This becomes even more important with the growing use of online learning in higher education, which has made designing, developing, teaching, and assessing IS courses more challenging for IS educators (He et al., 2014).

Wisdom is directed to authentic, humane, and virtuous processes and results, and incorporates non-rational and subjective elements into decision-making (McKenna & Biloslavo, 2015). The principles of wisdom should underlie pedagogic skills, such as moral imagination, understanding of values and humanity, global perspective based on local knowledge and values, critical skills, alterity, and the virtuous mean and balance (McKenna & Biloslavo, 2015). Practical wisdom can also inform the delivery of IS courses. For example, practical wisdom can offer an effective way of handling plagiarism in IS courses, by providing a holistic understanding of the motivations of those engaged in integrity-breaching activities (McHaney et al., 2016).

The multidimensionality and complexity of wisdom, as well as institutional and conceptual barriers, however, make it difficult to incorporate wisdom into a unified universally applicable pedagogy. Institutional barriers include limitations such as a lack of time for teachers to prepare and teach wisdom-related content, budget limitations, as well as social and government pressure to graduate industry-ready students. As Glück et al. (2019) argue, a major obstacle is the requirement for close supervision, monitoring, and constant encouragement; and seasoned teachers may not necessarily want to be closely supervised, especially as the teachers themselves are expected to be models of wisdom. Glück et al. (2019) suggest that a wisdom-based mode of teaching is unlikely to succeed without thorough training and supervision, requisite support and resources, and adequate compensation for teachers.

Conceptual barriers include theoretical and pedagogical limitations that have arisen with the rapid, incessant rise of technology and information that have overloaded and outdated traditional concepts of teaching. Indeed, the concept of higher education itself, and its value propositions, may need to be reconsidered in light of a dynamic and challenging future. To this end, education and educators play a central role in fostering knowledge as well as wisdom in the transition from a knowledge economy (where the focus is on knowledge and intellectual workers) to a wisdom economy (where ethics, moral values, and emotions are also considered in addition to financial factors in organizational and executive decisions and actions) (Jakubik & Müürsepp, 2022). In the same vein, Rocha et al. (2022, p. 437) suggest that future research in relation to phronesis development in organizations should focus on questions such as: "What tools can we collectively and individually use to foster phronesis?" "How can we structurally anchor phronesis in organizations?" And "how can unlearning enhance group phronesis in organizations?" Future studies could seek an enhanced understanding of the educational opportunities that whole-of-organization Enterprise Systems may offer in wisdom training and awareness.

Across individual, organizational, and inter/national levels, dealing with unforeseen complex challenges associated with emerging technologies requires an integral world view of socio-technological, political, and economic systems. Wisdom offers such an overarching framework that helps to holistically address such complex human phenomena (Karami & Parra-Martinez, 2021). Examples of the issues in the context of IS are the lack of trust in AI, in misinformation and pseudo-science, and rising challenges around cyber-security and privacy. As Jeste et al. (2020, p. 999) argue, to thrive in the modern society, we need to look beyond intelligence to wisdom: "AI technologies of the future will require new conceptual and computational models based on human wisdom and not human intelligence, to produce Artificial Wisdom. An Artificial Wisdom agent can serve as an assistant, peer, or coach. It can help make humans wiser." Further studies could investigate the opportunities and challenges involved in teaching wisdom in the context of emerging technologies such as Artificial Intelligence.

Another conceptual barrier is associated with the cross-situational variability of wisdom. Wisdom at the individual level is regarded as socially created and bestowed (Grossmann, 2017) and, as Glück et al. (2015) state, wisdom can be susceptible to situational constraints. Future studies can therefore investigate how the success of any teaching program that claims to foster wisdom-related characteristics can be assessed (Huynh & Grossmann, 2020).

Future research could investigate the ability of teachers to teach wisdom. Teaching wisdom may be predicated on teachers

already possessing wisdom competencies themselves. We can imagine that this would be a contentious study, but questionnaires already exist in the psychology domain that test for wisdom and it would be interesting and worthwhile to adopt and test them in the academic context.

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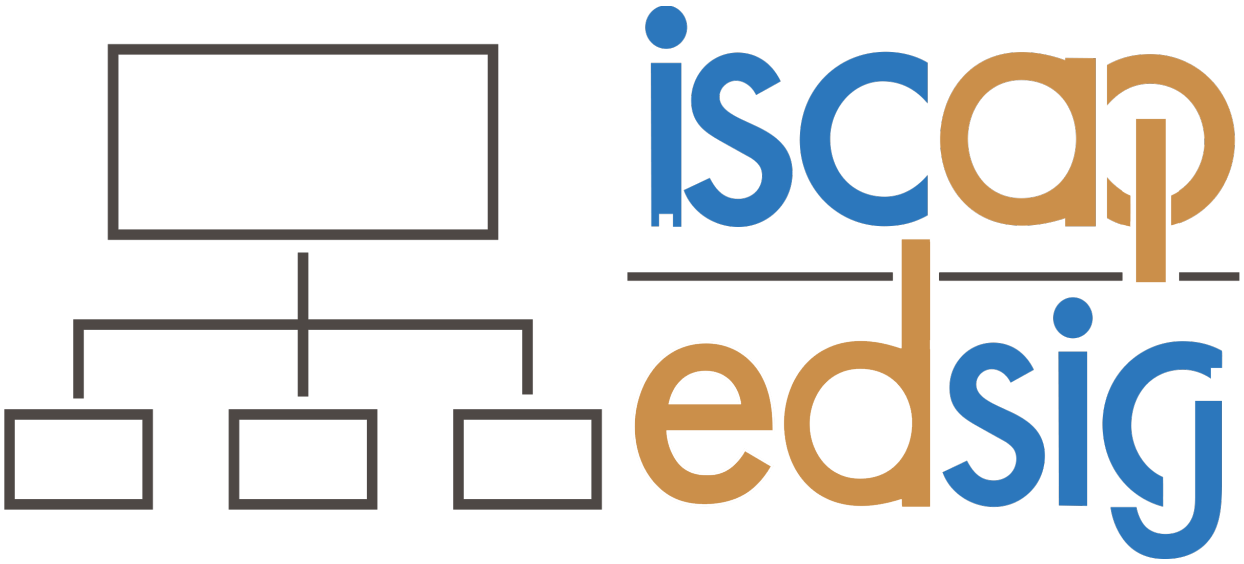

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