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INSTRUCTIONAL DESIGN AS KNOWLEDGE MANAGEMENT:

A KNOWLEDGE-IN-PRACTICE APPROACH TO CHOOSING INSTRUCTIONAL METHODS

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ABSTRACT. Decisions about instructional methods are becoming more complex, with options ranging from problem sets to experiential service learning projects. However, instructors not trained in instructional design may make these important decisions based on convenience, comfort, or trends. Instead, this paper draws on the knowledge management literature and specifically the knowledge-in-practice framework to develop a theoretical process for choosing instructional methods. This process classifies the underlying knowledge structure of learning objectives along the dimensions of tacitness and learnability, then matches the knowledge structure with instructional methods that will be the most appropriate fit for students working towards that learning objective. We propose that the integration of knowledge management with instructional design offers valuable insights into the process of choosing appropriate instructional methods, and our framework can help instructors determine which instructional methods are the best match for their learning objectives.

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INSTRUCTIONAL DESIGN AS KNOWLEDGE MANAGEMENT: A KNOWLEDGE-IN-PRACTICE APPROACH TO CHOOSING INSTRUCTIONAL METHODS

As management instructors, when we are offered a new course, it can feel like we are being given a blank slate. Beyond developing learning objectives, we must design instructional methods that will help students achieve those objectives (Reigeluth & Carr-Chellman, 2009b). Instructional design decisions are critical, yet the abundance of choice can be overwhelming. Some instructors may stick with the tried and true, using face-to-face lectures and individual assignments. Others may be drawn to newer methods, such as simulations, service learning and internship-based education. We argue that current frameworks, including the dominant Bloom's taxonomy, usually end with learning objectives, a step prior to the final step of choosing instructional methods (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). This challenge is metaphorically related to the last-mile challenge of package delivery services; they can move packages to within a mile of the end destination relatively efficiently, compared to the resources expended to move packages the last mile. In the same way, instructors now have guidance shaping instructional design up until the point of choosing among instructional methods, yet that final decision is crucial to the success of all previous decisions. Instructional methods ought to be applied mindfully, based on an understanding of each method's appropriateness with respect to the intended learning objectives, yet frameworks give minimal guidance on how to make these decisions. Given the current profusion of instructional method options, instructors would benefit from a theory-based rationale for determining which instructional methods are more likely to help learners achieve the intended learning objectives. Our purpose in this manuscript is to

develop guidelines to help instructors make their ‘last mile’ decisions, by helping instructors choose instructional methods based on the underlying knowledge structure of learning objectives.

Instructional methods refer to teaching and learning techniques, such as lecturing, the case method, simulations, homework problems or assignments. Research tends to examine their effectiveness in terms of student outcomes (Bernard et al., 2004), based on the assumption that methods found to be more effective *on average* ought to be applied more often. However, methods found to be effective for achieving one type of learning outcome may be inappropriate for achieving another (Magni, Paolino, Cappetta, & Proserpio, 2013). Although it is now commonly understood that instructional methods have varying levels of effectiveness and efficiency for different types of learners (Kolb, 1984), who exhibit varying levels of self-efficacy (Bandura, 1997), motivation (Hofer & Pintrich, 1997), and student development phases (Magolda, 1992; Magolda, 2004), in this paper, we make the argument that instructional methods also have varying levels of effectiveness when matched with different learning objectives, based on the foundational knowledge structure of those learning objectives. Instead of repeating what is already known about individual factors and developmental phases predicting learning outcomes (Cross, 1992; Knowles, Holton, & Swanson, 2011; Perry, 1970), we limit our discussion of these factors in favor of explaining the model from the perspective of knowledge management. Our intent is always that our model ought to be applied in concert with others that emphasize individual differences among learners. We recommend the work of Coffield, Moseley, Hall and Ecclestone (2004a; 2004b) for their comprehensive reviews of learning styles models.

To build the argument specifying which instructional methods fit particular learning objectives, we integrate theories from the fields of knowledge management and instructional

design. Specifically, we draw on the knowledge-in-practice (KIP) framework, which argues that when management systems are designed to match the underlying knowledge structures of work, it is more likely to lead to desired organizational performance outcomes (McIver, Lengnick-Hall, Lengnick-Hall, & Ramachandran, 2012; McIver, Lengnick-Hall, Lengnick-Hall, & Ramachandran, 2013). By extending this knowledge management framework to the domain of management education, we argue that desired learning outcomes may be more likely to occur when instructional methods are adopted based on degree of fit with the underlying knowledge structure of learning objectives. Specifically, the knowledge structure of learning objectives becomes the contingency upon which instructional method decisions are based. We combine this knowledge management lens with a theory of instructional design, to produce additional insights that could not be developed from either lens independently.

Instructional design theories are both prescriptive and probabilistic, meaning they propose how to increase the chances of achieving desired learning objectives (Reigeluth, 1999; Reigeluth & Carr-Chellman, 2009a). Consistent with this definition, our framework integrates the KIP framework with Reigeluth and Moore's (1999) learning processes to guide instructional method decisions by linking learning objectives with knowledge management, learning processes and instructional methods (representing the four steps of our instructional design process model). Additionally, the model that results from the intersection of these research areas facilitates a deeper understanding of the form of knowledge underlying learning objectives, and guides management instructors towards instructional methods likely to trigger learning processes that fit their learning objectives. We primarily use examples from international management education throughout this paper, as an exemplary educational domain that includes a range of learning objectives, including cognitive, affective and behavioral learning objectives (Eisenberg,

Härtel, & Stahl, 2013), and which the Association to Advance Collegiate Schools of Business (AACSB) recommends including as part of most accredited business education programs (AACSB International, 2011). Our intent is to help administrators and faculty leaders make curricular and infrastructure decisions, help executive education professionals decide on targeted educational methods to apply, and help management instructors face the blank slate of instructional design.

The rest of the paper elaborates our process model of instructional design (Figure One). Step one involves choosing learning objectives. Although this step is much broader than we can cover here, our framework relies on instructors breaking course-level learning objectives into more specific learning objectives by topic, module or class. Step two elaborates how to classify the knowledge structure of learning objectives, using the KIP framework. Step three integrates KIP with learning processes based on Reigeluth and Moore's (1999) proposed synthesis of instructional taxonomies. Finally, step four involves choosing instructional methods that are likely to trigger appropriate learning processes, based on the KIP/learning process mapping of learning objectives developed in steps two and three. We end by discussing the implications of extending the KIP framework to an educational context and discuss future research and teaching potential.

INSERT FIGURE ONE HERE

STEP ONE: SPECIFYING LEARNING OBJECTIVES

One of the first activities for designing a course is identifying desired learning objectives. Most management instructors do this, at least informally. In other words, they have an idea of the

knowledge skills and abilities they want students to develop by the end of the course. Broad learning objectives for the course are then used to develop more specific or granular learning objectives for each module, class session, or topic. For example, a cross-cultural management course with an overall learning objective to develop cultural intelligence in students (Thomas et al., 2012) might include a specific learning objective for one class session to identify which regions of the world tend to be associated with each cultural value dimension. In a human resources course where the overall learning objective is to demonstrate competence with basic human resource procedures, the specific learning objective for one session might be to demonstrate competence with designing a basic incentive system. In this paper, learning objectives refer to these more specific granular objectives, rather than broad overall course objectives.

Most universities expect instructors to state learning objectives and the AACSB expects business schools to assess students' learning based on learning objectives. Thus, developing broad, course-level, learning objectives and breaking them down into more specific learning objectives is an essential first step in the process of instructional design. However, this step has already been examined at length, with theories providing guidance on developing effective learning objectives, beyond what we could offer here. We recommend Reigeluth and Carr-Chellman's (2009a) edited volume on instructional design, for readers interested in learning more about developing learning objectives and Merriam and colleagues' (2007) book, for those interested in learning theories and the adult learner. In this paper we focus our attention on the process of selecting instructional methods once course-level learning objectives have been broken down into more granular (e.g. daily or module-based) learning objectives. The subsequent step is to classify the underlying knowledge structure of each of the more granular

learning objectives so they can be mapped onto learning processes appropriate for working towards each objective.

STEP TWO: CLASSIFYING THE KNOWLEDGE STRUCTURE OF LEARNING OBJECTIVES

After defining course-level learning objectives and breaking them down into more specific objectives, we argue that instructors should then classify objectives based on their underlying knowledge structure. This is where knowledge management research can make an impact on management education. McIver and colleagues (2012; 2013) proposed the knowledge-in-practice (KIP) framework to understand work from a practice or activity perspective. Specifically, KIP refers to the information and know-how involved in the sequences, routines, capabilities, or activity systems for conducting work in organizations (McIver et al., 2013). *Information* refers to the facts and data that can be understood, stored, and transferred (Kogut & Zander, 1992; Winter, 1987) and *know-how* refers to skills and expertise that are action oriented (Cook & Brown, 1999; Polanyi, 1966). In this framework, *practice* refers to the way in which work gets done and knowing how to do it, such that practices are the actions engaged in by individuals, groups, or units to accomplish things (Brown & Duguid, 2001; Orlikowski, 2002). As originally conceptualized, the KIP approach shifts emphasis from static conceptualizations of knowledge management to the dynamic practices involved in managing it. In other words, it is focused on means over outcomes.

Extending Knowledge-In-Practice to Management Education

When the KIP framework is applied to management education, it uses the term *knowledge* to refer to the information and know-how involved in working towards learning objectives, such as practicing new skills, and *knowledge structure* to refer to classifying

knowledge. Most learning objectives share an activity-driven approach to classification, where activities range from remembering to creating (Anderson et al., 2001; Bloom et al., 1956; Krathwohl, 2002). That is, learning objectives are action oriented and should state what a student should be able to *do* at the end of the learning period or session. Action verbs such as recall, create, list, describe, define, compare, analyze, demonstrate, and synthesize, state the behaviors students are expected to perform and are fundamental to learning objectives. When the end-goal activities implied by learning objectives are mapped onto practice-based activities implied by the KIP framework, the resultant fit clarifies which instructional methods (practices) will most clearly help students achieve learning objectives.

KIP is a particularly appropriate framework for classifying the knowledge structure of learning objectives and selecting appropriate instructional methods because it prioritizes the fit between activity-driven learning objectives and methods that might facilitate learning of those activities, rather than conceptualizing learning objectives as static objects. This approach is consistent with Blackler's (1993) argument that theories of knowing should focus on the activity or practice, not on static knowledge itself. For example, new approaches to management education emphasize the process of learning, including therapy-based techniques (Mendenhall, Arnardottir, Oddou, & Burke, 2013) and techniques that force learners to have their expectations disconfirmed (Rosenblatt, Worthley, & MacNab, 2013), both approaches consistent with current learning theories (Hofer & Pintrich, 1997). This KIP approach means attention is shifted from content to the activities a student needs to be able to accomplish. Ahead, we explain how to classify the underlying knowledge structure of learning objectives with respect to their degree of tacitness and learnability (McIver et al., 2012).

KIP Tacitness involved in learning objectives

Tacit knowledge is a form of knowing that is inseparable from action because it is founded through doing (Orlikowski, 2002). Within the domain of management education, we define the *tacitness* of knowledge-in-practice as the information and know-how involved in working towards learning objectives that is unobservable and difficult to articulate (Galunic & Rodan, 1998; McIver et al., 2013; Nelson & Winter, 1982; Polanyi, 1966; Winter, 1987). For example, a highly tacit learning objective is becoming comfortable with uncertainty as part of change management processes, whereas a less tacit learning objective is demonstrating the ability to use pre-determined indicators to measure change over time. Despite the way tacitness and explicitness are commonly used to describe opposing ends of the same continuum, Polanyi (1958) first introduced the idea of tacit knowledge and later (1966) built on his work to argue that all knowledge involves some degree of or is rooted in tacitness. We follow his guidance and describe learning objectives with respect to their degree of tacitness (more or less), not as tacit versus explicit objectives.

KIP Learnability involved in learning objectives

When analyzing the activities or practices that lead to learning, it is pragmatic to understand how easy it is to engage in each of those activities or practices (Brown & Duguid, 2001; Lave & Wenger, 1991). Within the KIP framework, the learnability of a practice consists of the type and amount of study, accumulated comprehension, and expertise that is required to understand the information and know-how involved (McIver et al., 2012). Extending this to an educational domain, we define the *learnability* of educational knowledge-in-practice as the type and amount of study, accumulated comprehension, and expertise that is required to understand the information and know-how involved in learning objectives. The learnability of KIP captures

the ease with which someone can perform the activities involved in working towards learning objectives, assuming they were previously unfamiliar with the content. While prior research has clearly shown that students may learn practices at different rates due to individual differences (Bandura, 1997; Hofer & Pintrich, 1997; Kolb, 1984; Magolda, 2004), making characteristics of the learner important, our contribution is to reframe learnability as a characteristic of the knowledge involved in working towards learning objectives. Learnability describes the extent to which the know-how needed to perform certain kinds of learning objectives is inherently more difficult to perform than the know-how needed for other types of learning objectives, because the underlying knowledge structure is more challenging to master. This definition emphasizes the type of learning and the ease of learning, rather than the time involved, although these may be related. For example, analyzing cultural paradoxes – where cultures include aspects that seem contradictory – is less learnable than understanding individual facts about a culture, because the former requires a higher level of cognitive complexity to process, and thus, is more difficult to learn (Gannon, 2008).

The learnability construct challenges a widely held assumption that tacit activities are comparatively more difficult to learn than information driven or less tacit activities. The degree of learnability of KIP has been shown to vary with a number of knowledge characteristics, including complexity (Kogut & Zander, 1992), causal ambiguity (Szulanski, 1996), inconsistency (Ansari, Fiss, & Zajac, 2010), and the amount of information or depth of prerequisite knowledge that may need to be accumulated. Although there is likely to be a relationship between the degree of tacitness and learnability in a learning objective, the degree of learnability also relies on factors beyond tacitness, supporting the theoretical distinction between these dimensions.

In some instances learnability distinctions are already ingrained in curricula and educational settings. Lower level courses, which usually involve higher learnability objectives, are often prerequisites for higher level courses, presumably involving lower learnability objectives. This curricular organization scheme suggests that some of the concepts we are discussing are already accepted within higher education. Yet, we think it is useful to be even more specific with regard to defining knowledge structures within a course, and not only between them. Together, the dimensions of tacitness and learnability can be used to map the underlying knowledge structure of learning objectives, resulting in four KIP quadrants: (1) *enacted information* (high learnability, low tacitness), (2) *apprenticed know-how* (high learnability, high tacitness), (3) *accumulated information* (low learnability, low tacitness), and (4) *talent and intuitive know-how* (low learnability, high tacitness). Examples and further descriptions of each type are provided in table one.

These four KIP types parallel those described by McIver and colleagues (2012, 2013), but are tailored to the domain of management education by indicating how learning objectives in each quadrant can be achieved, based on the tacitness and learnability of practices involved in working towards them. The quadrants represent extreme positions which reflect end points on continua, not discrete categories. Therefore, variations are expected within and across learning objectives. However, the ontological separation suggested in the framework provides a necessary level of analytical convenience (McIver et al., 2012). Figure two depicts these four knowledge-in-practice types and they are described in detail ahead.

INSERT FIGURE TWO AND TABLE ONE HERE

STEP THREE: MAPPING LEARNING PROCESSES ONTO KNOWLEDGE STRUCTURE OF LEARNING OBJECTIVES

Before selecting instructional methods for each learning objective based on the underlying knowledge structure involved, it is important to use an instructional design framework to understand the range of potential learning processes, and how each one helps learners achieve certain learning objectives. There is not one generally accepted definition or framework of learning processes and many authors have offered various perspectives on the concept (Reigeluth, 1999). The most well-known classification of learning processes was developed by Bloom and his colleagues (1956), whose hierarchical classification scheme ranges from knowledge to evaluation. More recent revisions of Bloom's taxonomy have shifted the classification labels from nouns to verbs, resulting in learning categories that range from remember, understand, and apply, to analyze, evaluate and create (Anderson et al., 2001). Gagné (1985) also proposed a widely used taxonomy of learning processes with three levels including verbal information in which a learner can state a fact, intellectual skills in which a learner interacts with the environment, and cognitive strategies in which a learner develops skills to manage her own learning. Other well-known taxonomies of learning objectives include Anderson's (1983) distinction between declarative knowledge, defined as understanding material in chunks and relationships, and procedural knowledge defined as knowledge about how to do things, Ausubel's (1963) distinction between rote learning and meaningful learning and Merrill's (1983) proposed taxonomy including remember verbatim, remember paraphrased, use a generality, and find a generality.

Although the KIP framework theoretically could be mapped onto each of the learning process frameworks mentioned above, we use Reigeluth and Moore's (1999) synthesis of earlier

learning frameworks for three reasons: it incorporates previous works on learning processes, including those mentioned above; it frames learning in terms of activities, such as memorizing and applying rather than objects, such as knowledge and application; and the activity lens was designed to facilitate clear links to instructional methods likely to trigger each learning process. Compared to the static approach common to earlier frameworks (Ausubel, 1963; Bloom et al., 1956; Gagné, 1985), Reigeluth and Moore's activity lens represents a slight yet important shift from nouns to verbs, complementing the activity lens of the KIP framework. Reigeluth and Moore (1999) defined four different types of learning processes: memorizing information, applying skills, understanding relationships, and applying generic skills. Each of these learning processes represents an ideal fit for one of the KIP quadrants, depending on the underlying knowledge structure of learning objectives. As updated by Reigeluth and Carr-Chellman (2009a), these four learning processes can be arranged such that they map onto the KIP framework, with two cognitive learning processes (memorizing information and understanding relationships), and two that include behavioral aspects (applying skills, and applying generic skills). In addition, the four categories were originally theorized as hierarchical, with lower-order and higher-order learning processes, parallel to Bloom's original model. In the following, we describe each KIP quadrant using a running example from music learning to illustrate, then argue for its mapped relationship with one of Reigeluth and Moore's (1999) learning processes. These learning processes will be the basis for choosing instructional methods in the fourth and final step of our process.

Learn enacted information by memorizing information

Learning objectives classified as *enacted information* are based on underlying knowledge that has a relatively low proportion of tacitness and is highly learnable, such as learning to read

sheet music and memorizing songs to play. Objectives in this quadrant can be reached efficiently using methods categorized as 'memorizing information' by Reigeluth and Moore (1999). Although a small amount of tacit knowledge is always involved (Tsoukas, 1996), articulated information is the primary driver of the learning objectives that have an underlying enacted information knowledge structure. Thus, it is appropriate to use memorizing information processes to help students work towards learning objectives classified as enacted information.

Memorizing information describes learning that involves memorization, such as memorizing country names and locations to fill in a blank world map. This category parallels Bloom's (1956) knowledge, Ausubel's (1963) rote learning, Gagne's (1985) verbal information and Anderson et al's (2001) remember categories. Although learners still need to think about concepts while memorizing information, it does not involve questioning assumptions, pushing the boundaries of the concept, or seeking alternative applications. Other examples include learning facts about the history, politics and geography of a region, learning vocabulary in a new language, or learning which cultural dimensions are usually associated with different regions of the world. For each of these examples, the underlying knowledge structure undergoes few variations, is well-established and requires little questioning, representing an ideal fit for learning objectives categorized as enacted information. These learning objectives are usually considered to be foundational knowledge for all other international management education.

> *Proposition 1: When the underlying knowledge structure involved in learning objectives is low in tacitness and highly learnable, instructional methods that trigger 'memorizing information' will increase the likelihood of achieving successful learning outcomes.*

Learn accumulated information by understanding relationships

Accumulated information captures learning objectives with underlying knowledge which, like enacted information, is low in tacitness, but in contrast has an information component that is difficult to learn, such as learning how all of the different musical parts can support one another in ensemble pieces. The foundation of this quadrant's learning objectives remains primarily information, but the amount and type of information is vast and is applied differently under different circumstances. In addition, new information is often needed both to fit new paradigms and to accommodate exceptions discovered through the practice of learning and changing relationships (McIver et al., 2012).

The distinctions between learning objectives classified as enacted versus accumulated information are represented by the differences between 'sophisticated stereotypes' and cultural paradoxes (Bird & Osland, 2003). Enacted information involves memorizing the sophisticated stereotypes associated with different regions of the world, referring to a first best guess about what kinds of values one might expect, given someone's nationality. They are relatively easy to learn, and the information is largely explicit. By comparison, making sense of cultural paradoxes represents a type of accumulated information. Cultural paradoxes introduce some complexity by pointing out apparently contradictory values within cultures, such as American low power distance, combined with high levels of societal inequity (Bird & Osland, 2003; Gannon, 2008). This information is still mostly explicit, yet is much harder to grasp. The knowledge involved in this analytical task can be observed, codified, and disaggregated from its context, but it is more difficult to learn because it requires extensive mastery of complex forms of information. Given the difficulty of learning this information, despite low tacitness, we expect that the ideal learning process will be understanding relationships.

Understanding relationships is a higher-order cognitive learning process. It is related to Bloom's (1956) comprehension, Ausubel's (1963) meaningful learning, Anderson et al.'s (2001) understand, analyze and apply, and Gagné's (1985) verbal information categories. It involves interpreting ideas, challenging assumptions (Peltier, Hay, & Drage, 2005), verifying complex information, and thoroughly probing and examining an issue (Kember et al., 2000). It involves not just thinking about a process or concept, but also critiquing its assumptions. This learning process fits well with learning objectives classified as accumulated information.

Proposition 2: When the underlying knowledge structure involved in learning objectives is low in tacitness and difficult to learn, instructional methods that trigger 'understanding relationships' will increase the likelihood of achieving successful learning outcomes.

Learn apprenticed know-how by applying skills

Apprenticed know-how describes learning objectives with underlying knowledge that has a relatively high proportion of tacitness but has direct and clear learning paths and direct or domain-dependent skills, such as learning how to play a new instrument. In contrast to enacted information, the underlying knowledge is mostly tacit, but similarly, the learning objectives remain relatively easy to learn through trial and error (McIver et al., 2012). Examples include learning to pronounce Chinese linguistic tones correctly, learning to behave appropriately in a new cultural setting (for example, learning to use chopsticks, or driving on the left side of the road in South Africa), or learning to use culturally-appropriate body language during intercultural negotiations. All of these examples are learnable, but they must be practiced (often repeatedly) before one can say that a student has truly internalized and can perform the behaviors of the learning objectives. That is, it is not enough for someone to understand that South Africans

drive on the left; one must learn how to drive on the left before claiming competence of this type of skill.

Courses with titles like *Doing Business in India* often focus on enacted information and apprenticed know-how, teaching region-specific information, and having students practice culture-specific behaviors. Learning objectives classified as apprenticed know-how usually feature limited information requirements. Learnability is high, however, because the connections between required actions and outcomes are consistent and can be replicated. The high tacitness and high learnability of the knowledge structure of these learning objectives fits well with the learning process called applying skills (Reigeluth & Moore, 1999).

Applying skills refers to learning how to do things. It is related to Bloom's (1956) application, Anderson's (1983) procedural knowledge, and Gagné's (1985) intellectual skill categories. Applying skills is common in training contexts, and is generally easier than a deep understanding of complex relationships (Reigeluth & Moore, 1999). Similar to memorizing information, applying skills emphasizes a surface approach to learning, although this does not necessarily mean it is unimportant (Peltier et al., 2005). For example, learners often practice using proper etiquette for different parts of the world, such as protocol for exchanging business cards. This lower-order, behavioral learning process is an appropriate fit for learning objectives classified as apprenticed know-how.

Proposition 3: When the underlying knowledge structure involved in learning objectives is highly tacit and learnable, instructional methods that trigger 'applying skills' will increase the likelihood of achieving successful learning outcomes.

Learn talent and intuitive know-how by applying generic skills

Talent and intuitive know-how describes learning objectives with underlying knowledge which, like apprenticed know-how, is primarily tacit, but unlike apprenticed know-how, is less learnable (McIver et al., 2012). The underlying knowledge involved in the learning objectives in this quadrant can be characterized as "artistry", such as the nuanced know-how required to become a master musician. It is based on know-how that is complex and that evolves as new experiences arise and as conditions change. For example, knowing how to manage a diverse team requires a complex, changing set of knowledge, depending on the specific individuals who are part of a team, and the team's unique context. The type of underlying knowledge in this learning objective goes beyond knowing about the different personalities represented on the team (enacted information), being able to analyze a situation using theories of effective teamwork (accumulated information), or having the capability to use team project management software (apprenticed know-how). The underlying knowledge in learning objectives classified in this quadrant often stands on a foundation of knowledge from the other three quadrants, but it also requires that learners are able to adapt and question the theories, and change their own behaviors based on the theories, across a range of situations. The knowledge underlying these learning objectives is typically unobservable, intuitive, and unspecifiable; connections between required actions and outcomes are often complex and inconsistent, and the actual steps needed to learn the required actions are uncertain, ambiguous, or unclear (McIver et al., 2013; Sadler-Smith & Shefy, 2004). Thus, learning this type of knowledge requires a higher-order learning process that includes both cognitive and behavioral aspects, such as applying generic skills.

Applying generic skills involve creating new ideas, combining parts from previous experiences, making judgments about the value of ideas, and breaking down problems. It is

related to Bloom's (1956) analysis, synthesis and evaluation categories, Gagne's (1985) cognitive strategies, and Anderson et al.'s (2001) evaluate and create learning objectives in which individuals learn skills for the self-management of learning and thinking. Although it shares a behavioral aspect with the category 'applying skills', 'applying generic skills' differs in terms of level; applying generic skills is a higher-order learning process, indicating the ability to apply skills across subjects or situations, and it usually takes much longer to acquire generic skills. As a higher-order learning process with both cognitive and behavioral aspects, it relies on a foundation of the other three quadrants of learning processes. This form of learning process requires learners to already understand relationships, learn to apply behaviors, and it additionally involves reflection, such that learners become aware of and challenge personal ingrained (and often unconscious) assumptions about themselves or about the world (Peltier et al., 2005). Mezirow (1985) suggested the need to challenge one's own conscious and unconscious beliefs and values and enable learners to become aware of why they think, perceive and act as they do. Given these high-level cognitive and behavioral activities, the learning process of applying generic skills is an ideal fit for learning objectives classified as talent and intuitive know-how.

Proposition 4: When the underlying knowledge structure involved in learning objectives is highly tacit and difficult to learn, instructional methods that trigger 'applying generic skills' will increase the likelihood of achieving successful learning outcomes.

Once instructors classify the knowledge structure of learning objectives, and map appropriate learning processes onto the knowledge structure of each, the fourth and final step is to choose specific instructional methods likely to trigger each learning process. This final step draws out the utility of our process model, by helping to guide actual instructional method decisions.

STEP FOUR: SELECTING INSTRUCTIONAL METHODS

Instructional methods refer to the techniques and tactics instructors use to help students work towards each learning objective (Reigeluth & Carr-Chellman, 2009b). In 1987, Shulman criticized reform in education, suggesting that selection of instructional methods was, at best, misguided and misunderstood (Shulman, 1987). Twenty-five years later this statement has new meaning and elevated importance as educators are offered an unrelenting choice of instructional methods, while frameworks for selecting appropriate methods remain elusive. In Shulman's (1987) view, educational instructional expertise was not only the mastery of a subject matter, but also included pedagogical knowledge or the "clear understanding of how particular topics, problems, or issues are organized, represented, and adapted to a diverse set of interests and abilities of learners, and presented for instruction" (Shulman, 1987). Thus, one key to effective instructional design is understanding which instructional methods are appropriate for helping learners achieve objectives across a range of topics, problems and issues. Simply put, it is essential to determine boundary conditions for the applicability of different instructional methods. Towards that end, we offer suggestions about instructional methods that are likely to trigger each learning process identified in step three.

When learning objectives are classified as enacted information, the information itself becomes a primary driver of learning, suggesting instructional methods such as lectures and other forms of content delivery such as reading texts are most efficient. Thus, these learning objectives can be learned using instructional methods that trigger memorizing information without necessarily pushing pedagogical boundaries. Instructional methods that engage this type of learning process could include reading, flash cards, quiz games, or answering fact based questions. Instructional methods for learning objectives in this quadrant are less likely to rely on

applying generic skills or understanding relationships. Instead, the essence of learning objectives within this quadrant is internalizing codified knowledge, such that instructional methods ought to focus on efficient content delivery. This does not mean that the instructional methods used in this quadrant cannot be creative or exciting for students. For example, students can efficiently retain information about different regions, through instructional methods such as clicker response questions, crossword puzzles, "quiz bowl" or Jeopardy-type games. Within international management courses, educators might ask students to research and write encyclopedia entries on different regions of the world. Breaks in a traditional lecture could also be used for students to explain concepts just learned to a classmate in order to enhance information retention for both parties. These examples all fit within the category of 'memorizing information'.

In order for students to work towards learning objectives classified as accumulated information, instructional methods need to go beyond just accepting information, towards critiquing it, and understanding the *why* under the *what*. Specifically, it is not enough for learners to read extensively to master learning objectives in this quadrant. In addition to extensive study, they must think deeply about what they have learned, to help make sense of, and internalize new insights (Jonsen et al., 2010). Instructional methods that trigger 'understanding relationships' learning processes are expected to be the best fit for learning objectives in this quadrant. Sample instructional methods that would trigger understanding relationships include reading multiple perspectives on the same topic, engaging in debates, or studying cultural paradoxes and cultural metaphors, both of which forces learners to think more deeply about culture than traditional cultural values frameworks (Gannon, 2008; Gannon & Pillai, 2010). For example, after reading many conflicting accounts of Indian culture, it might be possible for a foreigner to learn when cultural norms apply, and when they do not. Educators might also use debates, devil's advocates,

and open-ended group discussions where students are encouraged to extend or compare concepts, find new applications or extend and make use what is being learned. Cases that take place under ambiguous conditions help students think critically about the theories they use (Lane, Maznevski, Dietz, & DiStefano, 2009).

Although learning objectives classified as apprenticed know-how contain a high proportion of tacitness, they are highly learnable. Students learn knowledge in this category by rehearsing the practices needed to gain this know-how, and understanding why different behaviors are used in different situations. Learning takes place by applying skills, and is based on experiencing what works and what does not, such as recreating activities through repetition, simulations and role-plays. This often requires a constructivist approach to learning (Lave & Wenger, 1991). The need to replicate contexts and recreate situations becomes important for students, who will often learn by doing, through frequent repetition of an action until it is ingrained (Kember et al., 2000). Instructional methods that trigger habitual action encourage learners to develop the underlying knowledge through repetition of actions and experiential trials (Kolb & Kolb, 2005). For instance, students in pairs could practice the proper way to say or perform a region-specific greeting, or how to accurately pronounce a team lead's name. For learning objectives in this quadrant, redundancy of activities can be a virtue since it is often desirable for the behavior to become subconscious and automatic (it may be useful to explain this concept to students to get buy in) (Molinsky, 2007).

The repetition involved in learning the underlying knowledge in this quadrant differs from the repetition involved in memorizing information, because apprenticed know-how requires students to learn how to apply different skills rather than learning information about the skills. For example, being able to pronounce Chinese names using the correct tones requires practice

(applying skills), whereas learning about the existence of tones is purely informational (memorizing information).

Learning objectives classified in the final quadrant – talent and intuitive know-how – are rarely transferable through direct lectures or reading, and are only developed through idiosyncratic experiences and learning processes involved in applying generic skills. Management educators have used methods such as cognitive behavioral therapy (Mendenhall et al., 2013), international collaborative projects (Erez et al., 2013; Taras et al., 2013), internships or service-learning projects (Pless, Maak, & Stahl, forthcoming), facilitated by an intensive process of critical reflection about a learner's own learning processes. Students should be pushed to reflect critically on these experiences through journaling and discussions where students consider how the experience has changed their way of looking at the world, and to think about how they will change their future behaviors based on what they have learned. Other examples of instructional methods that might trigger applying generic skills include reflection assignments and learning journals, especially when combined with experiential activities that force learners to confront their assumptions (Mendenhall et al., 2013).

FEEDBACK LOOP: REVIEW AND REVISE

Once instructional method decisions are made, other instructional design decisions must also be made prior to launching a course, such as how to design assessments and rubrics (Arter & McTighe, 2001), along with the combination of formative and summative feedback (Hattie & Timperley, 2007). Although most instructional methods decisions are made only once per course, most instructors teach the same or similar courses time after time. Therefore, this feedback loop represents the learning that instructors take away each time we teach a course. It is a reminder to implement new insights in future iterations.

Each of the four types of knowledge underlying learning objectives has inherently different characteristics, and thus, requires a different set of instructional methods. Given an environment of resource constraints and an overabundance of instructional methods, we assert that educators can use this framework to focus resource-heavy instructional methods on learning objectives that merit them.

DISCUSSION

The educational landscape is in the middle of an onslaught of innovative ideas and proposed solutions. The framework presented here is designed to help management instructors take a step back and examine how to choose instructional methods based on the underlying knowledge structure of learning objectives. By combining the KIP framework with instructional design, it provides direction on selecting instructional methods to help learners work towards learning objectives. Our paper provides a number of suggestions on how this can be accomplished. However, it is important to clarify several assumptions driven by our intention to combine the knowledge-in-practice framework with a learning process guide to increase the probability of achieving desired learning objectives.

We take a utilitarian perspective on education. We assume that teaching should be directed toward using approaches that promote the greatest amount of learning to the greatest number of persons in the class. We are not focusing on methods that are designed primarily to "bring up the bottom" or "raise the top." Furthermore we assume that teachers are truly interested in the largest number of students attaining educational objectives and not simply delivering a class that sorts students into high and low performers.

We also make the assumption that most educational journeys are a combination of many different types of learning objectives and a broad range of pedagogical approaches. This includes

understanding contextual influences such as how learning occurs in informal settings such as at home with family and more formal settings such as traditional institutional settings (Merriam et al., 2007). It also includes the notion that some learning objectives are best achieved with relational learning (Gergen, 2009) while others are more likely to be achieved independently (Moore, 1973). A holistic approach that incorporates the learner, the context, and the process is important for designing effective instructional methods (Merriam et al., 2007).

We see several theoretical and practical implications emerging from the model developed in this paper: it illustrates a way to reconcile a long-standing debate on whether the purpose of management education should be building cognitive abilities or developing practical managerial skills and behaviors; it highlights the underappreciated importance of learning basic information and skills through memorization and repetition; and it illustrates the interdependence of learning objectives across quadrants.

Theoretical Implications

First, there is an inherent tension for management instructors between helping students learn how to think critically in general (a purely cognitive outcome), and training them in the specific skills needed in the workplace (involving both cognitive and behavioral outcomes) such as the ability to design an effective compensation package, or offer productive feedback to subordinates. This tension parallels the tension exhibited within the knowledge management literature. Some researchers see knowledge management as essentially epistemology, where the knowledge itself is the goal (Tsoukas & Vladimirou, 2001). Others see it as a means to an end, where the end goals of knowledge management are the business or managerial outcomes that can come from effective integration or management of organizational knowledge (Grant, 1996). The KIP approach to knowledge management takes the middle ground in between those two

approaches, in that it recognizes the importance of knowledge, but also focuses on the practices and activities underlying that knowledge (McIver et al., 2012).

In the same way, our model takes a middle road with respect to the tension in management education, between those endorsing the cognitive view that management education ought to develop cognitive abilities such as critical thinking (Athanassiou, McNett, & Harvey, 2003; Boyatzis, Stubbs, & Taylor, 2002), and those endorsing the behaviorist approach that management education ought to develop practical managerial skills and behaviors (Elmuti, Minnis, & Abebe, 2005; Whitley, 1988). When the KIP model is used as a basis for instructional method decisions, it explicitly includes both cognitive and behavioral learning processes, thus requiring the full range of instructional methods. Instead of a dichotomy, we see room for both forms of learning objectives, requiring completely different instructional methods. Effective intercultural negotiation cannot be taught via flash cards, just as a critical sense of the degree to which research is trustworthy is unlikely to be learned during an experiential project. The KIP approach helps to clarify the situation-specific applicability of each approach, thus, linking the two sides of this debate.

Second, our model can be seen as a reminder that basic skills are still important. Given the current emphasis on experiential education, basic skills can sometimes be overlooked or forgotten, such as learning facts about history, politics, languages and religion, or simply how to shake hands in a different culture. Understanding relationships and applying generic skills are generally assumed to be superior to either applying skills or memorizing information (Reigeluth & Carr-Chellman, 2009a). It is commonly argued that these former instructional processes will lead to higher student engagement, better learning outcomes and foster life-long learning (Sutherland & Bonwell, 1996). For example most instructional innovation pushes instructors

towards higher order thinking skills (HOTS). Cope (2003) goes so far as to suggest that non-reflective activities (i.e. routine or habitual activities) stagnate the learning processes.

A logical implication of our model is that the full range of instructional methods may be appropriate, depending on the knowledge structure of learning objectives. While we agree that developing higher order and critical thinking skills is important, we contend that our model illustrates why each of the four different learning processes outlined above have their place in a well-run academic program and even an individual course. Motivating students to become proficient at each learning process is an important part of developing learners who are likely to attain the full range of learning objectives. There is often such excitement about new, experiential and highly active pedagogical methods that it is easy to overlook the importance of basic information and skills, learned through efficient instructional methods. Nonetheless, lower-order learning processes remain a foundational building block that students need, in order to make sense of higher-level knowledge and participate in higher levels of learning such as applying generic skills.

Third, despite our representation of learning objectives within categories, it is clear that higher-order objectives (especially those classified as talent and intuitive know-how) rely on knowledge located in other quadrants. For example, even intensive cross-cultural experiences combined with critical reflection will not produce expected learning outcomes without being grounded in basic information such as a general understanding about the cultures with which students are interacting. Not only does the model presented here emphasize which instructional methods fit best with learning objectives in each quadrant, but it also highlights the interactions among quadrants, and the importance of building on knowledge from each quadrant to the

others. To illustrate these interactions, we annotated the following quotation with our proposed instructional methods in square brackets:

> "Experiential exercises and role-plays help students see the impact of their behaviors on people who have different perspectives [understanding relationships], and help them *feel* the uncertainty, anxiety, and joy of working across boundaries [apply skills], thereby increasing motivation to engage with people from other cultures. But without the discipline of reflection [apply skills] and ties to well-structured knowledge [memorize information], the exercises do not build toward more learning; just like not all expatriates learn to work effectively across cultures despite experience." (Maznevski, 2013, p. 510).

This model does not unpack how the context, such as spatial and temporal phenomena (e.g., Fahy, Easterby-Smith, & Lervik, 2014), can facilitate or constrain learning and knowledge sharing for each quadrant of our model. Considerations of context open larger discussions around the role of societal and educational institutional norms and formal and informal structures (e.g., Hotho, Saka-Helmhout, & Becker-Ritterspach, 2014). Contextualizing this research will be an important stream of research moving forward.

Practical Implications

Given a context of resource constraints, instructors must select and justify instructional methods that are both efficient and effective. However, critical questions remain unanswered, about the conditions under which one instructional method becomes more effective than another. Although this framework has shed light on one condition that ought to be considered when making instructional methods decisions, other factors also remain important, such as the availability of resources (class time, facilities, locations), individual differences among students, and developmental phases (Magolda, 2004). We do not advocate ignoring these other factors, but

instead, argue that the knowledge structure of learning objectives should be an important, if not the primary, consideration on deciding how to teach.

Over the past few decades, there has been significant progress in understanding that more experiential and active instructional methods tend to improve student outcomes (e.g. Auster & Wylie, 2006; Serva & Fuller, 2004). Indeed, there is now such general consensus around the principle that experiential approaches are beneficial, that it is possible for experiential methods to be adopted without adequate examination as to their purpose. By applying a knowledge management lens to instructional design, we refocus instructional design decisions on the knowledge that is the objective of instruction. In addition to the excitement with which management instructors adopt new instructional methods, such as service learning, problem-based learning and simulations, we endorse increased mindfulness about the purpose of each experiential method. Specifically, the most resource-intensive experiential approaches ought to be applied in those situations where the learning objectives merit that instructional approach.

For example, it is becoming increasingly common to use virtual teams as a foundational part of management courses (Erez et al., 2013; Taras et al., 2013). However, instructors using these approaches should take care to incorporate learning objectives and their associated methods from all four quadrants, to help students make sense of their experiences and learn from them. When students are left to work on experiential projects without having an understanding of foundational knowledge (enacted information), a safe space to practice intercultural skills (apprenticed know-how), or complex cognitions developed through understanding relationships (accumulated information), they might develop unintended conclusions, like deciding that it is too frustrating and time consuming to bother working across cultures (Taras et al., 2013).

CONCLUSION

Given the proliferation of options for instructional methods, now may be an appropriate time to provide additional direction about when to adopt specific instructional methods. Beyond looking at alternative instructional methods as cost-effective or convenient, administrators, policymakers and instructors can evaluate which mix of methods is best suited to their learning objectives. Maximal learning is expected to occur when educators classify the underlying knowledge structure of learning objectives, match them with the appropriate learning process and fit them with the appropriate instructional methods. With this paper, we encourage educators to become more mindful about when to apply a specific method and provide direction to help them apply methods where they will be most appropriate.

FIGURE 1

Process model for choosing instructional methods based on knowledge-in-practice

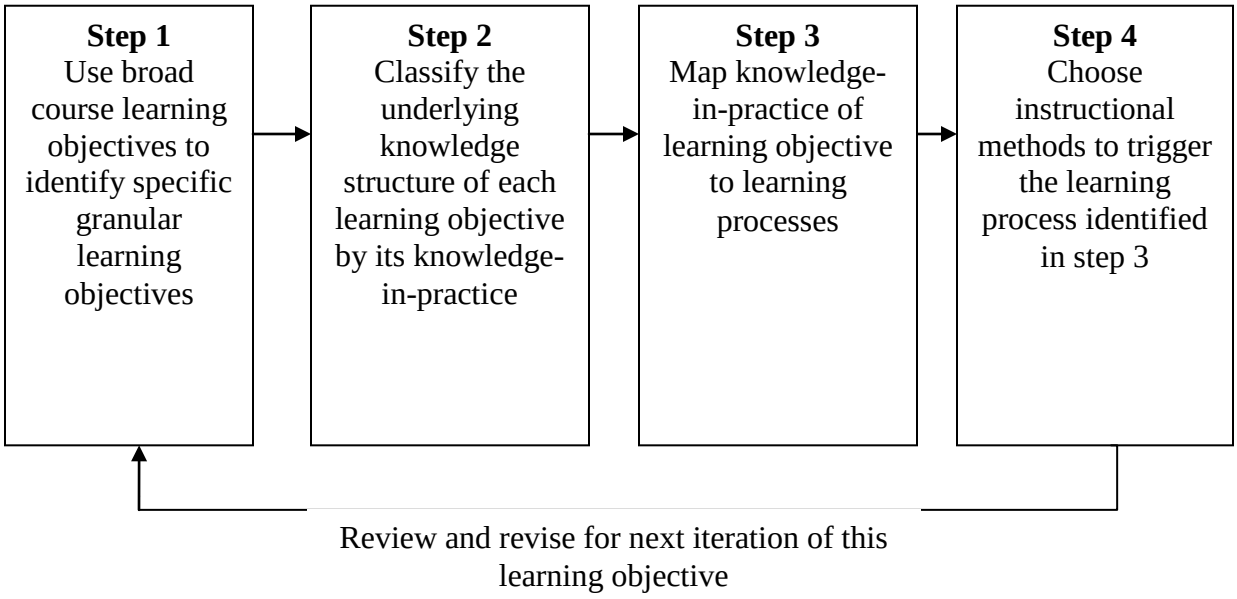

FIGURE 2

Step 3: Knowledge-in-practice framework mapped onto learning processes
(adapted from McIver et al. 2013)

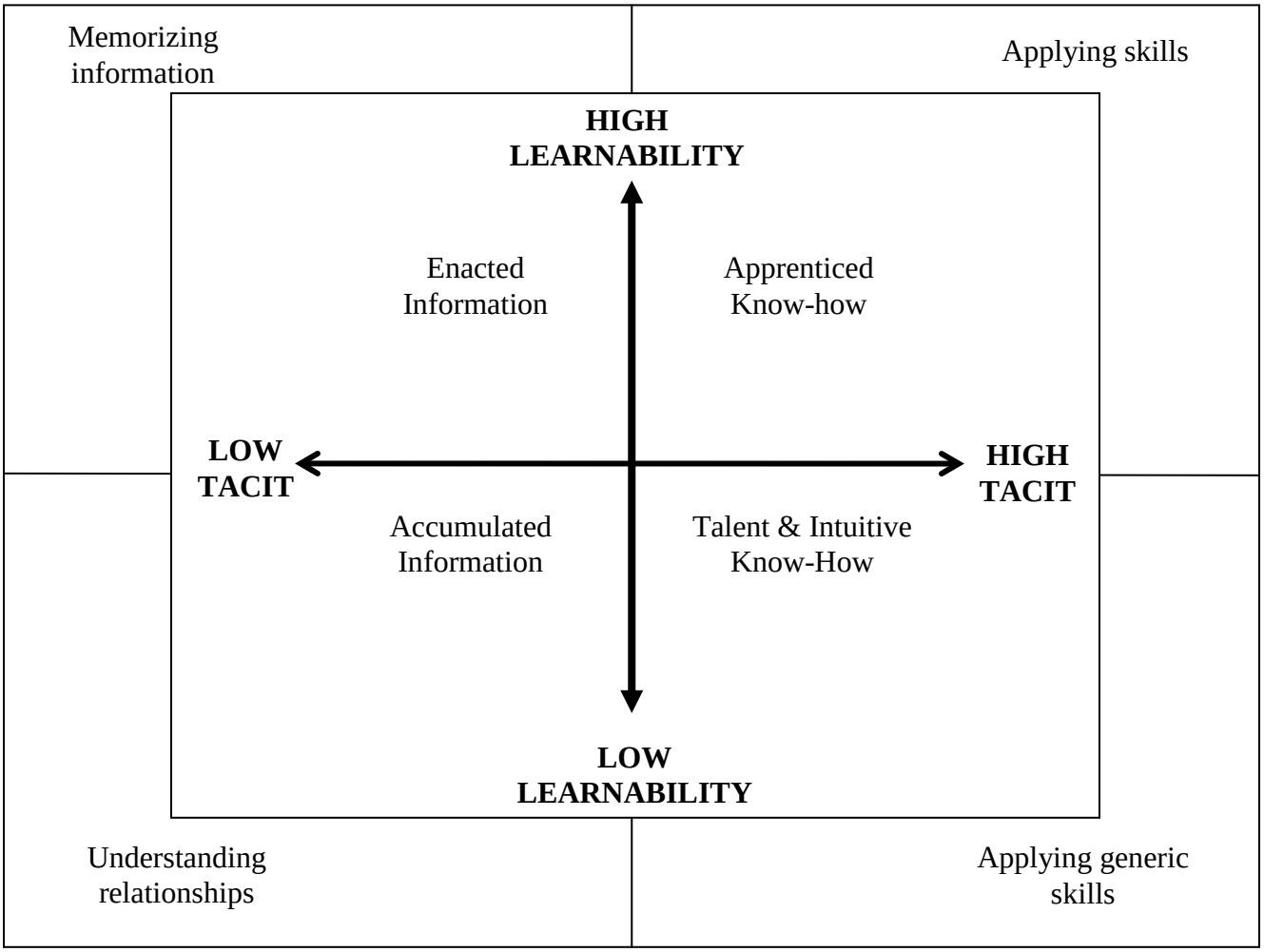

TABLE 1

Knowledge-in-Practice Samples for International Management Education

	Enacted Information Low Tacit High Learnability	**Accumulated Information** Low Tacit Low Learnability	**Apprenticed Know-how** High Tacit High Learnability	**Talent & Intuitive Know-how** IV. Low Tacit Low Learnability
Sample learning objectives: *Learners should be able to …*	• Accurately report country-specific information • Report which cultural values are usually associated with a region	• Analyze cultural foundations, metaphors and paradoxes • Apply theory in relation to specific situations	• Be able to use culturally-appropriate behaviors • Code-switch for different cultural contexts (Molinsky, 2007)	• Successfully lead an international team • Participate effectively in an international project
Instructional methods should trigger this type of learning process (Reigeluth & Carr-Chellman, 2009b)	Memorizing information	Understanding relationships	Applying skills	Applying generic skills
How is learning achieved?	Through repetition and stable routines, memorization. The goal is to transfer knowledge accurately and efficiently.	Through careful analysis and extensive study of theoretical foundations. The goal is to propose applications based on analytical insight.	Through mentoring, practice, and repeated experiential trials, with feedback to hone skills. The goal is to develop a natural 'feel' for the practices.	Through exploration and hands-on experimentation. The goal is to develop one's own techniques for high performance in complex, changing situations.
Sample from international management	The informational aspects of a course such as *Doing Business in India;* history, politics, economy, geography, language basics. Culture-specific knowledge.	Most of the content in case-based courses. Sophisticated cultural analysis, beyond standard cultural values frameworks.	The behavioral aspects of a course such as *Doing Business in India*; how to offer business cards, make introductions, etc. Cultural skills.	Understanding when to adapt one's behavior, and when to emphasize one's differences, depending on situation or goals. Cultural meta-cognition.
Exemplary educational Instructional methods	• Reading about / listening to region-specific information	• Class debate • Analyze one's own culture, using a culture-	• Practice culture-specific behaviors • Culture	• Cultural immersion • Study abroad • International service-learning

	• Answer comprehension questions • Quizzes / in-class games / flash cards to help with memorization	survey or cultural self-study • Analyze theoretical foundations for a case and propose possible solutions	simulators • Culture role plays	• Journaling and reflecting throughout international experience to foster insight

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