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Teaching Tip
Socio-Cultural Learning to Increase Student Engagement in Introduction to MIS

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ABSTRACT

Introduction to Management Information Systems (MIS) is a challenging course to teach because of the broad expanse of rapidly-changing material, the centrality of the course to the business curriculum, students' demand for interactive teaching rather than traditional lecture, and general student disinterest in or lack of familiarity with the subject. Further compounding these problems, faculty may not be adequately comfortable with or trained in active teaching modalities. To address these challenges, we used principles of socio-cultural learning to design a system of class activities to teach the dynamic concepts commonly found in the Introduction to MIS course. Faculty can adapt and customize this system to suit almost any teaching style without significant preparation. Capitalizing on students' own experiences, we provide ad hoc activities that encourage students to work outside their comfort zone, to communicate and challenge material, to value their own expertise, and to gain confidence working independently. This paper specifically answers the call for more research explaining the "how" of teaching rather than the "what" and will prove useful and immediately actionable for novice and seasoned faculty alike.

Keywords: Introductory course, Student engagement, Active learning, Social behavior, Pedagogy

1. INTRODUCTION

A course in Introduction to Management Information Systems (Intro to MIS) covers a broad expanse of dynamic material that blends business and technical concepts (Nelson et al., 2011; Sirias, 2005). This course directly affects student enrollment in the MIS major (Firth et al., 2008; Whelan & Firth, 2012), and at most AACSB-accredited schools, it stands as a core course for business majors and minors alike (Kroenke & Boyle, 2017). Technology and the business applications of information technology (IT) shift rapidly, making it difficult for faculty to find current textbooks. What's more, today's Gen Z students – digital natives who grew up with technology – prefer to interact with each other or technology rather than sit passively in traditional lectures (Guo et al., 2013; Mandviwalla & Schuff, 2014). Students demand personalized, social communication and frequent feedback (Vodanovich et al., 2010), but feedback requires significant faculty time and energy. Therefore, in addition to managing course content that changes at a breakneck pace with outdated textbooks, instructors must build relevant and engaging lessons to avoid losing students' interest. How can busy faculty efficiently meet these demands?

When we first prepared to teach Intro to MIS, we struggled with issues that most new faculty face. First, how to lecture for 50 to 75 minutes in multiple sections, often scheduled back-to-back and meeting multiple times a week while keeping students interested? Presenting slides densely packed with text threatened to bore even *the lecturer*. Then, students might skip class or worse, tune out, and student course evaluations would plummet. Second, how to cover the broad range of material in an impactful way *without* more slides? Our professional expertise provided a starting point but did not encompass the wide range of topics packed into the course objectives. Entire textbook chapters did not exist when we worked in industry,

such as blockchain and social media. The examples in the text were sufficient but outdated. How to efficiently find good examples to hook students' attention? If lectures borrowed too heavily from reading, it risked rendering us, the teacher, superfluous to student learning. In an attempt to address these issues, we devised a set of activities to increase student engagement in Intro to MIS, guided by the learning philosophies found in socio-cultural learning (SCL). We believe that the spirit of SCL is key to making the Intro to MIS course more engaging and easier to teach.

After piloting this system for one year, the first author shared it with other Intro to MIS colleagues. In this paper, we present the activities and teaching philosophy as well as student and faculty reflections. We discuss lessons learned and provide evidence that these activities made the Intro to MIS class more engaging while still ensuring we covered the material. Although experienced faculty may initially argue that the suggestions herein seem "old hat" or that surely "everybody already does this," we were surprised to learn that faculty continue to rely primarily on lectures (Burch et al., 2015; van Ewijk et al., 2020; Vercellotti, 2018; Walsh & Seldomridge, 2006). "Most college courses, even at a university with an ILS initiative, tend to be in a traditional, passive lecture style" (Vercellotti, 2018, p. 206). Perhaps because graduate programs and tenure criteria rarely encourage alternative pedagogies (Ehrlich & Fu, 2013; Fertig, 2012; Jawaharlal, 2017), faculty choose lecture over active learning more often than not due to its expediency and relative safety.

The extant literature urges faculty to adopt learner-centered teaching methods (Levesque-Bristol et al., 2019; Rissanen, 2018; Robinson et al., 2016), and the present study adds to that need. Our contribution includes a system of SCL activities with plug-and-play components, which faculty can easily add to their lessons in Intro to MIS to supplement their areas of expertise and existing resources. Moreover, rather than relying on faculty, these activities rely on students to find relevant examples of the material, guided in discussion by faculty, and make sense of them within a social context, as prescribed by SCL. We present suggestions to create and customize the activities in addition to specific examples of their use. The next section briefly reviews the literature on Intro to MIS, SCL and active learning, which clearly highlights an increasing need for these types of activities.

2. THEORY AND LITERATURE REVIEW

Prior research studies have advanced methods to more efficiently teach and engage students in Intro to MIS, reflecting faculty's attempts to improve the course over time. Although these studies stress that keeping this course updated and engaging is both paramount and difficult, few papers provide readily useable solutions that are easily ported from one semester to the next or any that are directly co-created by examples from students. As shown in Appendices A and B, our diligent search of the relevant literature did not identify any direct examples of in-class activities that rely on students' experience. Rather, the dominant model of instruction relies on the instructor for examples. This distinction (between the dominant model and ours) portrays a fundamental shift in focus which is necessary to increase student interest and engagement by personalizing material in a new way.

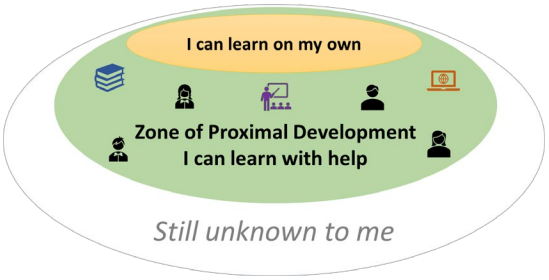

Figure 1. Vygotsky's Zone of Proximal Development (modified from McLeod, 2018)

Faculty engaged in active learning may be surprised to learn that every example of active learning in the Intro to MIS course (as shown in our analysis in Appendices A and B) centers on the faculty's experience rather than the students'. None of these examples relies on students sharing examples within a socio-cultural context. Textbooks sometimes ask the reader to "think about a time when…" but relying on students to both read the book and reflect on the material before class is a far cry from asking them to present and rely on their expertise in front of peers then combine everyone's experiences into a coherent understanding. As described below, our approach extends previous examples by using tenets of SCL theory.

2.1 Socio-Cultural Learning (SCL)

Socio-cultural learning states that learning is affected by one's social environment (Hoy et al., 2013). SCL is attributed to Vygotksy, an early 1900s Russian psychologist who explored the social implications of constructivist learning theory (Packer & Goicoechea, 2000; Yoders, 2014). Social constructivism attempts to explain how individuals learn and construct meaning with a social context. A fundamental tenet is the rejection of "universal truths" transmitted by an instructor to the student; rather, learners build individual versions of their own truth in tandem with prior knowledge. Considering that many decisions in IS are context-based without universal truths, it makes sense to teach students with an SCL process. Therefore, we engage them directly in the process of co-creating meaning rather than making them dependent on faculty examples.

SCL, in particular, acknowledges the social nature of learning. Learning is not a solo act; rather, learners co-construct meaning within a social system and interaction with others (John-Steiner & Mahn, 1996). The system is structured (a) to recognize that everyone's unique perspective has value and meaning and (b) to facilitate the social sharing of these unique personal experiences by which everyone's learning is enriched. Vygotsky theorized that a learner could only get so far on their own, but they could learn and develop much more *if provided social help.* Vygotsky termed this gap the zone of proximal development (ZPD), illustrated in Figure 1.

In an SCL system, the instructor provides a starting point for learning and through social interactions, the class co-creates understanding and builds existing knowledge to make sense of new content. They test and modify their understanding through guided social interaction and are further supported by the textbook and Internet resources. This system uses learner-centered activities, a type of active learning (Krahenbuhl, 2016; Leidner & Jarvenpaa, 1995).

2.2 Active Learning

Active learning is a broad umbrella term that means the student is actively doing something to learn (Fink, 2003). Mitchell et al. (2017) define active learning as "one time or ongoing student exercises that…encourage student thinking and participation in an effort to engage students in the learning process" (p. 23). In general, if students are involved in doing something to learn rather than passively absorbing material (such as listening to a lecture), then it is active learning. Active learning examples include student presentations, collaborative projects, discussion, case analysis, formative assessments, and games (Chen & Holsapple, 2014; Gudigantala, 2013). While active learning is encouraged in the literature, it can be difficult to find practical examples of how to do it in the classroom.

A literature review for active learning in Intro to MIS yielded 15 examples, as shown in Appendices A and B. Of these, 12 reported using active learning in the classroom, and the other three provided proposals to use it. Some used team assignments or projects and a few presented curricula redesigns with active learning, but none mentioned SCL or provided a way to use active learning throughout the semester. The dearth of works available may be because learner-centered teaching requires the instructor to relinquish a significant amount of control over the classroom. This leap of faith can be difficult to do and is hard to do well. This approach is sometimes termed "guide on the side" as opposed to "sage on the stage," and it can be unsettling, especially for instructors who prefer to feel or appear "in control" of the classroom.

Instructor-centered approaches (such as traditional lectures) result in faculty spending "too much time focusing on what to teach and not enough time on how to teach," even though learner-centered instruction is more effective at producing graduates "prepared to fulfill the workplace requirements of the 21st century" (Saulnier et al., 2008, pp. 172-173). One reason for instructor-centered teaching is the myth that the instructor must cover all of the material and therefore has no time for active learning frivolities (Blumberg, 2009). (Some educators believe that learning shouldn't be "too much fun," although we respectfully disagree, based on tenets of neuroscience.)

Additionally, the development and implementation of active learning exercises can be challenging because they take time to plan, explain, and execute; their effectiveness is difficult to assess quantitatively, and sometimes they flop altogether (especially the first time). As a result, faculty opt to continue using less risky, more traditional instructor-centered approaches. Upon analyzing 37 online syllabi for the Intro to MIS course, Wang (2007) concluded that all instructors relied on lectures and readings, about half assigned essay writing and team projects, and a third used case analysis. These results suggest that faculty teaching Intro to MIS generally rely on an instructor-centered paradigm rather than a learner-centered one. See Appendices A and B for examples of active and cooperative learning in Intro to MIS as well as other MIS courses. We identify which studies are easily adopted and implemented, i.e., repeatable, for new instructors. Our analysis reveals that without exception, the methods rely on the instructor to find and present examples in class, which can be a time-heavy burden, both to initially create and to keep updated. Further, the examples used will be more interesting and relevant to the instructor rather than to the students, potentially alienating or disengaging them from the material.

Two central principles of active learning are to provide students with direct rather than vicarious learning opportunities whenever possible and for those opportunities to include activities from each of the three components of active learning: information and ideas, experience, and reflective dialogue (Fink, 2003). However, the term "active learning" is too broad to provide new faculty with specific guidance on what to do in the classroom. To date, academic research provides generalities but lacks specific examples of what to do and how to do it in the classroom. Thus, we took the active learning concepts one step further by adding socio-cultural learning. Rather than simply engaging with their own learning, students learn together.

3. TEACHING METHOD AND ACTIVITIES

3.1 Overview of Teaching Method

To address the above challenges, we designed active learning exercises based on socio-cultural learning theory. Rather than expecting the instructor to find examples of content, these activities encourage students to share their own experience and engage with the material in a social way. The instructor's role is to direct action, narrow down possibilities, and encourage students to question and co-construct meaning. In building these activities, we borrowed concepts from cooperative and collaborative learning. (Some concepts from these systems overlap with Team-Based Learning (TBL).) In these pedagogies, students work in teams, which improves communication and listening skills. However, these complex pedagogical systems are not easy to implement on an ad hoc or short-term basis. We needed activities that could be implemented quickly with minimal training or prep time. After searching the literature for examples, we were forced by necessity to create and adapt our own. Our system mines (or "crowd-sources" if you will) the expanse of experience readily available from students. As previously described in Appendices A and B, we did not find any similar examples of this method in the literature that spanned an entire course. Further, these activities are easily repeatable from one semester to the next.

These learning exercises capitalize on students' own experience, which personalizes material and increases engagement. The activities are simple and short and, thus, more efficiently use limited class time while still providing value and meaning to students. The socio-cultural framework recognizes the fact that multiple people with their myriad of differences bring meaningful learning opportunities to the classroom, and the modality of teaching should reflect the vast differences in technologies and concepts taught in Intro to MIS. As students advance in their careers, they will need to know how to assess knowledge and apply it in a social context. With this approach, they begin to practice doing that with peers, guided by faculty, as described in the activities shown in Appendix C.

Most students today are familiar with the Internet and social media; it would stand to reason that they have experience with at least some of the content and technology taught in the Intro to MIS course (word processing, spreadsheets, etc.), but they may not realize its relationship to the course. However, students' experiences are often gained through informal means and contexts, such as trial and error and from peers. Additionally, students' experience with some technologies may exceed those of faculty (e.g., Instagram, WhatsApp, and TikTok), while faculty's experience may exceed those of

students (e.g., databases and ERP systems). These differences should be mined as opportunities to teach differently, rather than discounted.

In the field of information systems, where context affects outcomes, it is imperative to teach students how to recognize and apply IS knowledge based on the context of the problem. Therefore, we capitalize on students' experiences and encourage them to apply their experience to the material rather than accept our experience as the *de facto* standard. We, as faculty, help them cross the ZPD along with help from peers. The activities described in Appendix C make students' learning more meaningful and personal to them. A single instructor could never find personalized examples for every student every semester. These activities empower students to identify useful, personal examples rather than commoditizing the instructor and textbook examples. Personalized examples have more relevance and meaning for students, which deepens their learning by engaging them in the learning process and can even provide faculty with opportunities for new perspectives.

These activities provide a breadth of learning modalities, such as drawing. Interacting with the course material in different modalities improves learning and encourages students to think about content and problems from multiple angles and viewpoints that they might not otherwise consider. With lectures, students typically assume that the faculty's viewpoint is the only one that matters, but here, ALL viewpoints are heard and considered. Students learn from their own viewpoint and those of peers. They can then judge for themselves which viewpoints are most salient (with faculty as a guide on the side). By considering multiple viewpoints in a social context, students are better prepared to apply their knowledge to new scenarios.

There is much to gain by introducing activities in the classroom that provide students with the opportunity to think about material and process it with others beyond just listening to a traditional lecture or applying it through homework assignments. In addition, instructors need to present relevant and engaging content. To address this need, we created a system of flexible, adaptable, "plug and play" activities for the Intro to MIS course, as shown in Appendix C. Over time these activities can adapt and grow, keeping up with changes in content, and as a side effect, reducing prep time from one semester to the next.

3.2 How to Apply These Activities in a Classroom

In this section, we explain how to implement this system for use throughout a semester, recognizing too that it can be used in part or in totality at any point. As faculty gain confidence with this system, they can continue making incremental changes over time. First, faculty will need to reconcile active learning with their current teaching style and learn to accede control to other speakers ("guide on the side" versus "sage on the stage" approach). The activities are easily added to existing lectures, because they rely on breaking up a 50- or 75-minute lectures into 10- to 15-minute segments (suggestions for class schedule provided in Appendices D and E). Sandwiched between mini-lectures are three- to five-minute activities (list provided in Appendix C), followed by guided reflection.

Activities only take three to five minutes but provide students an opportunity to think about and discuss material directly with peers in a social setting. Most activities in class are modeled on the concept of think-pair-share. Students identify their own example, then share it with a partner, followed by sharing with the class and reflection. The main goal is to encourage students to draw on and trust their own wealth of experience when solving a problem or learning new material. They then compare their understanding with others. Students are encouraged to rely on and use their own experience of the world first, then check with their peers, and finally present to the class. This practice trains students to seek information on their own, then in collaboration with others, which builds confidence (in trusting their own experience and their ability to find information to learn on their own). The class as a whole works together to traverse the ZPD. No experience is too big or too small, as long as it relates to the discussion.

Each activity is based on course objectives. For example, Chapter 1 objective to "define MIS" is practiced in the first activity. Students draw a picture of what MIS means. After reading the chapter, students should have a vague idea of the definition of MIS, but they struggle to explain it. (The MIS field has struggled with its own identity since its inception; this activity could offer a good entry point to discuss this struggle, if it is pertinent to the course.) Drawing a picture to illustrate MIS helps students think through what it means and sharing their thought process with peers helps them to make sense of their learning. Each person draws a personal illustration, and the class as a whole reflects on them. After giving students time to draw a figure (and remind them there are no wrong answers), volunteers share their diagrams with the class and explain what it means. We ask students to stand up or come to the front of the class to present their figures rather than physically taking the paper ourselves because this simple shift in focus gives students greater ownership of the process. While this activity sounds simple enough, when we asked a room of IS faculty to draw a definition for MIS, they remarked that it initially felt difficult.

A critical component of the SCL activities is the requirement for students to talk with each other and work together to make decisions and solve problems. Achieving that is not always easy, but fortunately, when informed of this expectation, students will accept it as the classroom norm, and most will enjoy it, although some may need occasional cajoling. One challenge or tension of getting students to talk with each other (the main goal here) is to have the courage to wait patiently through an occasional silence. A good "guide on the side" accedes control of the classroom's physical space. At first, students direct all of their answers to the instructor, but as they become more comfortable with the process, they begin directing answers to peers.

Given the opportunity, students begin to self-regulate. For example, before starting this system, we ask students to create discussion rules as a class. We painstakingly review each rule (akin to a systems analyst building a system and going through each requirement with a client one-by-one until everyone agrees), then ask for examples of following or not following the rule and how the class as a whole should enforce it. This exercise forces students to explicitly think through examples of each rule until a fair consensus is reached. For example, what does it mean to "be polite"? Does everyone have to raise their hand before speaking, ALL the time? If so, who acknowledges the next speaker (the instructor or the person speaking)? As students grow more comfortable taking control of the classroom space, class discussions become livelier and more engaging.

4. EVIDENCE AND LESSONS LEARNED

These activities were implemented at multiple universities with students from freshmen to juniors in a business program. Classes held prior to the COVID-19 pandemic were face-to-face, with enrollments between 30 and 45 students per section. As we adapted and changed these activities over the past three years, we identified lessons learned and caveats that we present here as evidence of the system's success. In addition to what we have learned from the faculty perspective, we also present feedback received from students on the activities.

4.1 Faculty Reflections and Lessons Learned

One objective of the activities was to increase student engagement with the material. We quickly learned that trying to award course points or grades for students' work created an unnecessary economic exchange that detracted from the activities. When points were awarded for completing the activities (rather than focusing on the material and the social context of learning), students' focus became more about "what to do to get full points" and less about the learning *experience*. Additionally, assessing students' work increased faculty work and, more importantly, took away the focus from engaging with and reflecting on the SCL process.

These issues can be resolved in a few ways. One, we emphasized to students that the goal is to engage with the material in order to better understand how it fits into a socio-cultural context. Focus on the importance of the discussions. Encourage students to take notes about the exercise and the examples gathered during class and to reflect on what they learn from the discussion, rather than worrying about a transaction of submitting something for points. The instructor informed students they should study this information because questions on the exam would relate to the exercises. Applied exam questions were written about similar but new situations.

Another way to resolve the focus on grades is to promise full points (usually de minimis) just for completing the activity (complete/incomplete). A simple way to include these points into the course design is to award them as participation points and to have students submit a file (their evidence of completion) to the LMS, which could also serve as attendance if needed. Many LMS grading tools will display a picture, Word, or PDF file in the grading window, facilitating a quick check that the submission is not blank and is at least an honest attempt. One faculty person asked students to submit weekly journals with one entry per class period (collated into one submission per course unit), in which students wrote 2-3 bullets for what they learned in class that day.

A second discovery was that learning names helped build community within the classroom. This feeling of community should logically improve student engagement and motivation. Every effort was made to learn students' names and stress that students should learn each other's names. We would periodically call on a student and ask if they knew the name of another student across the room. To facilitate this, double-sided name tents and seating charts proved useful.

Third, we needed to remind ourselves as instructors to discuss the activity once it was completed in order to connect it to the current topic. Reflection is an important step in any active learning pedagogy, as it helps cement learning in students' minds. Reflection in a social setting allows students to perform sensemaking tasks, analyze problems, and practice presenting and justifying their ideas with others. These experiences will better prepare students for team work in any upcoming courses and in their future careers. Reflection can be as simple as asking students how they might approach a new, similar situation in the future or connect the new ideas with their existing knowledge.

One instructor initially neglected to end the activity with reflection, and in some instances, due to timing issues, the learning opportunity from reflection was sacrificed. As a result, some students became confused about the purpose of the activity or perceived it as "busy work." One compensation for running out of time that one instructor used on occasion was a brief class announcement (usually sent as an email later in the day after class finished) in which a few reflection questions were posed, along with an urging for students to bring their answers to the next class. In that next class session, having one or two students share their reflections created the opportunity to provide a bridge between classes and to reinforce the value of the activities, priming students to be more engaged in each class. This process can also be used intentionally to extend the learning experience across multiple class sessions which increases time for reflection. For example, during the first class session for Chapter 12, the requirements elicitation in-class activity can be performed by students in pairs as described in Appendix C, activity 2a. In the next class session, the results of each student pair's elicitations are randomly distributed to other student pairs as described in the in-class activity 2b. Student pairs must then reflect on the activity they performed in the previous class session to be able to analyze the work produced by another student pair.

Fourth, if students were uncooperative or not talking to each other, we called on people or asked more specific questions. Sometimes the discussion was so exciting or interesting that students forgot or didn't realize that the examples were necessary to learn the material. If we observed students not writing or taking notes, we encouraged them to "write this down! It's important!" Reminding students what's important to write down can be especially helpful for first-year students who are still adapting to college and learning how to build study habits (Erickson et al., 2006).

In an introductory course such as Intro to MIS, it is easy to underestimate the relevant experiences and knowledge students can bring to the class conversations. Still, by using these in-class activities that require our students to participate in the creation or identification of the context and content, we make discoveries that may not have been made otherwise, and we all reap the benefits. For example, on multiple occasions within the context of an in-class activity, a student has identified themselves to be a small business owner, a successful entrepreneur, or a family member of a successful family-owned business. The knowledge and experiences of such students will enrich the learning experience of the entire class and contribute to the shared learning, which is a core component of SCL.

4.2 Evidence from Student Feedback

Comments from anonymous student evaluations highlighted that students generally liked the in-class activities and found them helpful. Multiple students said they appreciated that the activities showed them how the material directly related to "real life examples" that they could "apply to the real world." Additionally, they commented that "concepts were both illustrated and explained." One student wrote, "I found the class

to be different from others I've taken, but that's what made it fresh and interesting." The activities made the class "very current and not outdated" which was one goal of creating these activities – to keep the class fresh and engaging. Students felt that the course was kept up to date, even though it involved minimal updates from the instructor. One student wrote "I believe the course material is most relevant to our generation." The same student recommended "incorporate even more group work. This is essential and helpful."

The increased social nature of the teaching modality increased engagement and community within the course, which spilled out into other aspects of students' experience. One student wrote, "Class discussion questions connected the topics to real world things we could relate to. I also liked how we were in groups so it was easier to learn things from asking questions to peers outside of class." Another student remarked that as a transfer student, they were initially concerned that the level of engagement would be less than at their previous institution, but they were pleased to find that the structure of the course enabled a high engagement level, and that the course even included opportunities to meet peers. One student commented that they "enjoyed the collaboration" even though "some group work I found unnecessary." Another student "overall, somewhat enjoyed the course however can't say would enjoy taking the major." At least "the lectures were good because they were broken up into short activities so the class did not feel as long."

In terms of participation, in a survey of students who took the Intro to MIS course in Spring 2018, 35% said they participated *more* in this class versus other classes, and 41% participated about the same as other classes. Although we cannot make statistical generalizations from this data, these results suggest that the teaching activities encouraged student engagement in class more often than not. One student in this same semester remarked, "I think that the class is very engaging and I like that." We hope that the experiences of this class encouraged students to participate more in other classes as well and increased their confidence to speak in class and rely on their expertise.

4.3 Effectiveness of the Teaching Innovation

The original goal of these activities was to make the Intro to MIS course more interesting and engaging for students while simultaneously making it less burdensome for faculty to prepare up-to-date lessons each semester, particularly when the material continues to dynamically change each semester and with each new technology. For example, topics such as big data, cryptocurrency, artificial intelligence, and ransomware attacks are becoming more important. Additionally, the COVID-19 pandemic has changed the world in unexpected ways. None of that information will trickle into textbooks any time soon, but with these simple in-class activities, faculty can begin to explore these issues without having to do extensive background research. For example, the activity to draw the definition of MIS can adapt and change with each semester to fit students' new understanding of the definition of MIS, and faculty don't need to create or locate new media examples. In addition, the inclusion of an alternate way of learning material, by drawing, discussing, or researching, as opposed to memorizing a wordy outdated definition, introduces alternate learning modalities that today's students crave.

We consider these activities to be a success for students because student comments showed that they noticed the activities and felt more engaged in class because of them. As faculty, we feel they were successful because we weren't bored teaching the same material to multiple sections back-to-back. Each section's discussion was slightly different and if one section came up a bit short on examples for any given activity, we could share with them examples from a previous section, and thus provide students with at least one example from their peers, rather than a "sanitized example" from instructors that seemed less real. Better yet, that example from the previous section (or even a previous semester) might be just what was needed to jumpstart the conversation - students co-constructed meaning with peers to cross the ZPD together.

4.4 Adapting to Online Learning Due to COVID-19 Pandemic

One outstanding question we have been grappling with is how to adapt these activities, which were designed for in-person learning to an online environment, particularly as students grow tired of virtual sessions ("Zoom Fatigue"). We do not yet have an answer for this dilemma, but we hope to address it in future semesters. Like many of our colleagues, the rapid switch to fully online forced us back into old habits of pure lecture (or students attended but simply would not readily engage). Theoretically, one could pose a question then put students into paired or group breakout rooms to discuss their solutions, then return to the main chat to reflect on solutions. In a perfect world, we will be back in the classroom soon enough. But until then, we will work on how to adapt these exercises to online learning.

5. CONCLUSION

To teach Intro to MIS, faculty must keep up-to-date on rapidly changing technology while engaging students from semester to semester, which is no easy feat. This paper presented a flexible method to incorporate plug-and-play activities in existing lectures to address these challenges. Doctoral programs in the MIS field typically focus on research rather than on innovative teaching methods such as SCL and active learning. However, *in fine diei*, teaching is still faculty's "bread and butter." This research contributes to research on teaching Intro to MIS by providing support and guidance with practical, readily available and applicable activities based on principles of socio-cultural learning theory. Prior literature presents pedagogical processes without providing specific activities. We have attempted to fill this need by describing the activities themselves and how to implement them in the classroom from a practical standpoint. We answer the call to provide "actual implementation… how to use a teaching tool rather than what tools could be used" (Chen & Holsapple, 2014, p. 2).

Furthermore, these exercises encourage exploration and information seeking. Anyone working with technology in business needs to be able to find the correct information in a sea of wrong information. By encouraging students to look for answers independent of faculty and textbooks, faculty immediately empower students to succeed at sifting through information and putting it into context. Here, we provide more than just examples of exercises. We explain how we applied these exercises over multiple semesters to increase student engagement and build a sense of community in the classroom. We recognize that the main objectives of this teaching approach rely on SCL and active learning, which overlap with other techniques such as TBL because they are in the same genre

(versus passive learning). In fact, one instructor has embraced the TBL principle of assigning semester-long teams to reinforce the concept of community in the classroom. However, unlike TBL, our system is more open and flexible, requiring less advanced training and preparation to implement. It would be interesting to see how the activities presented here might be blended within a TBL environment.

These exercises have a few important contributions that should be stressed. First, they are reusable from one semester to the next with minimal faculty prep time. Second, they can be adapted to fit students even as the material changes. Unlike preprogrammed simulations, they are free to use and may be applied ad hoc with minimal prep time. They can be tailored to individual instructor's teaching styles. In fact, they could be adapted to different age levels as well. As new faculty, we struggled to find practical examples of how to apply theoretical pedagogical principles in our classrooms. Although prior literature covered learning theory quite well, it did not offer sufficient detail to repeat the experiments or to apply the methods to our own teaching. Here we present one attempt to bridge this gap. The Intro to MIS class is special because IT constantly changes. Our teaching methods need to adapt just as quickly, but as Eisenhower is credited with saying, "Plans are nothing; planning is everything."

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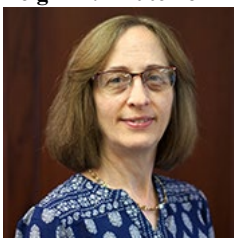

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APPENDIXES

Appendix A. Examples of Active Learning in Practice

Reference	Pedagogy	Ease of Repeatability for New Instructors
Riordan et al. (2017)	Experiential learning Active learning Interactive lectures Problem-based learning Project-based learning Simulation	Big-picture descriptions of the simulated environment and details of its implementation, student activities, and grading are provided
Burch et al. (2015)	Conception focused curriculum	Explanation of the process with implementation examples provided
Gudigantala (2013)	Active learning Lecture Student presentations Report writing	Present an outline of the semester-long lecture course with added active learning activities and project. Examples of several activities and the semester-long project are provided in separate documents with implementation details. Links to videos demonstrating various IS are included.
Ractham et al. (2012)	Social constructivist learning	Provide high-level information about setting up a Facebook site to enable better features than available with current learning management system. Lessons learned and the results of a student survey are provided.
Wang & Wang (2011)	Thinking paradigm Higher-order thinking model Reflective writing Integrated case analysis Reflection essay Self-evaluation	Proposes focusing on higher order thinking development through reflective writing assignments. Some guidance to implement the writing assignments is provided. Some guidance to assess the higher order thinking learning outcomes is provided. This technique hinges on students being "taught" the higher order thinking paradigms yet this paper does not elaborate on how they did that.
Frost & Pels (2010)	Class discussions Active learning	Example projects were described; resources for students are discussed; implementation limited to big picture with no specific class session details
Pridmore et al. (2010)	Lecture Multimedia case study	Explanation of how to implement the case study is provided with the lesson plan. Learning outcome survey items are provided.
Sendall (2006)	Case study Cooperative learning	Provides details about the results of one unique case study assignment which was related to an issue that students were personally affected.
Mukherjee (2005)	Active learning	Provides details of the class session to analyze technology issue; the topic and the series of questions students must answer about a particular technology (ATMs), followed by class discussion of each of the questions. Also provides the top answers to each question as provided by students
Sirias (2005)	Mini-cases Cooperative learning Conflict resolution Thinking Process Tools	Provides an example mini-case with step-by-step implementation details

Appendix B. Examples of Active Learning in Theory (no practice or no details of practice reported)

Published Works	Pedagogy or Teaching Technique(s) identified	Repeatability for Instructors
Fathelrahman (2019)	Student feedback Instructor reflection	One specific example of how reflection was used is provided
Mitchell et al. (2017)	Active learning	Twenty examples are presented, and the techniques are also explained. Basic details of implementation included. Include a summary table with category, research benefits, and possible challenges. Present an outline of a 75-min class with 3 active learning exercises to support a particular learning objective,
Drake (2012)	Mini cases Lecture Active learning Case study	Detailed examples for each of the three methods, and descriptions of how to use them in classroom are provided

Appendix C. Cooperative Learning Activities (These activities are based on Using MIS by Kroenke and Boyle, 10th ed.)

Chapter	Topic	Learning Objectives	Instructions to Students for In-Class Activities
1	Introduction to MIS	• Define MIS • Apply DIKW framework • List 5 tech laws • Explain why this class is important to your career path	1. Draw a picture of what MIS means to you. Write a few sentences in your notes to define it to a close friend or parent. Discuss your drawing with a partner before sharing with the class. 2a. Think-Pair-Share (TPS) activity. Create an example of Data-Knowledge-Information-Wisdom (DIKW). In your notes, write an example of DIKW you've experienced recently. Don't think too hard about it. Draw the words in a pyramid shape. 2b. Find a partner and share your DIKW example. Learn your partner's name and their example well enough that you could explain it to the class if called upon. In pairs, learn about partner, then introduce them. Tell us their name, major, something fun they did this summer or over break. 3a. TPS. Write down the name of a specific company with whom you have done business, one that uses IT in some way. Think about how the 5 tech "laws" affect business for that company. 3b. Form a team of 3. Learn names. Discuss your examples of how the 5 laws affect doing business in the 3 companies you identified.
2	Collaboration	• Explain why collaboration is more difficult than cooperation • Identify actions to keep up to date and relevant with rapid pace of technological development • Compare structured and unstructured decisions	1a. TPS. Write 1 or 2 sentences defining collaboration in your own words. Can you think of a time when you had a good experience collaborating with someone else? What made it work well? [In between 1a and 1b, present definitions of these terms.] 1b. Discussion. Review your definition of collaboration and the prior experience you wrote down. Was it collaboration or cooperation? Why? 2. In your teams, create a list of top 10 IT developments you've witnessed in your lifetime. Include year they became mainstream so you can build a timeline, for example: 2007: Apple released the touchscreen iPhone. 3. Discussion. How do you keep up with the newest tech? As business professionals, how can we keep our skills up to date? Identify 3 ways to keep up to date. 4. With a partner, think about your future career in business and decisions you might need to make. Write down: one example of a structured decision and one example of an unstructured decision. Which of these do you suppose can be automated more easily?
3	IS strategy	• Apply Porter's 5 forces model to a business's strategy • Find connections on LinkedIn • Review UML diagrams for system changes • Classify companies based on Porter's competitive strategies	1. In teams, consider Wal-Mart. Classify the 5 forces as strong or weak. How do they affect how Wal-Mart does business? How do you suppose IS affect Wal-Mart's ability to react to these forces? 2. TPS. Draw the 2x2 table for Porter's 4 competitive strategies. Identify a company for each cell in the 2x2 table. What IS do they use? 3. Team activity. Review Fig 3-8 and 3-9 on p 90-91. Can you identify what was changed? 4. TPS. Can you find the LinkedIn profile of a [university] grad who is or was working as a business analyst? What do they do? Where do they work?

Chapter	Topic	Learning Objectives	Instructions to Students for In-Class Activities
4	Hardware, software and mobile	• Convert decimal numbers to binary and vice-versa • List software acquisition methods • Compare advantages and disadvantages of thick vs thin clients on the web • Explain BYOD pros and cons	1. Individual or paired assignment. Complete binary calculations worksheet. [Available upon demand.] 2. TPS. Come up with as 2 or 3 examples of each kind of software (Custom, COTS, etc.) Discuss how to decide which one to choose. 3. Class brainstorming session. Advantages and disadvantages of thick-client/native vs. thin-client/web. 4. Discuss Bring Your Own Device (BYOD) policies on campus. How do they affect you? What will it be like at your future company? Should you have to BYOD?
5	Databases	• Define a database and list its parts • Compare design, data and special views in a database and identify when you might use each based on a company's needs	1. TPS. Write the definition of a database in your notes. List its parts. 2. Class discussion. Talk about your school ID and other information used to keep track of your school records. What might the design view look like? 3. Brainstorm activity. Why might users not need the raw data view?
6	Cloud	• List pros and cons of cloud services for a business • Discuss issues of net neutrality and digital divide and their effects on society	1. TPS. Suppose you were starting a company. What does your company do? Should your company use cloud services? Why or why not? Get in a team and discuss. 2. Debate Discussion. Will cloud replace physical devices? 3. Debate Discussion. Net Neutrality and digital divide issues.
7	Organizational Processes	• Compare structured to dynamic processes • Define enterprise and inter-enterprise systems • List parts of an ERP and a CRM • Explain why change is hard	1. TPS. Create a list of differences between structured and dynamic processes. 2. TPS. Consider [this university] as an enterprise within a system of entities. What might be an example of workgroups and inter-enterprises in relation to [this university]? What characteristics do the IS have? 3. Discussion. What kinds of information might be stored in a CRM? Why? 4. Discussion. What are pros and cons of information silos? 5. Physical activity. Stand up and cross your arms. Note which arm crossed over which. Now switch them. How does that make you feel? 6. Team work. Review the case study on p. 288-290 about the tale of 2 interorganizational information systems. What went right? What went wrong? Identify 5 lessons learned to help prevent future project failures.
8	Social media	• List the components that define social media • Design a social media strategy based on a company's strategic mission • Identify pros and cons of social media from the standpoint of consumers, companies, and providers	1. TPS. How many networks do you belong to? 2. TPS. Name the 5 components of Social Media. 3. Discussion. Why might cooking channels generate more revenue than beauty channels? 4. Discussion. What does it mean to say, you are the product? 5. Discussion. Should companies try to prevent ad block software? Why or why not? 6. Team work. Think about your potential company. Create a social media strategy to market your products competitively.

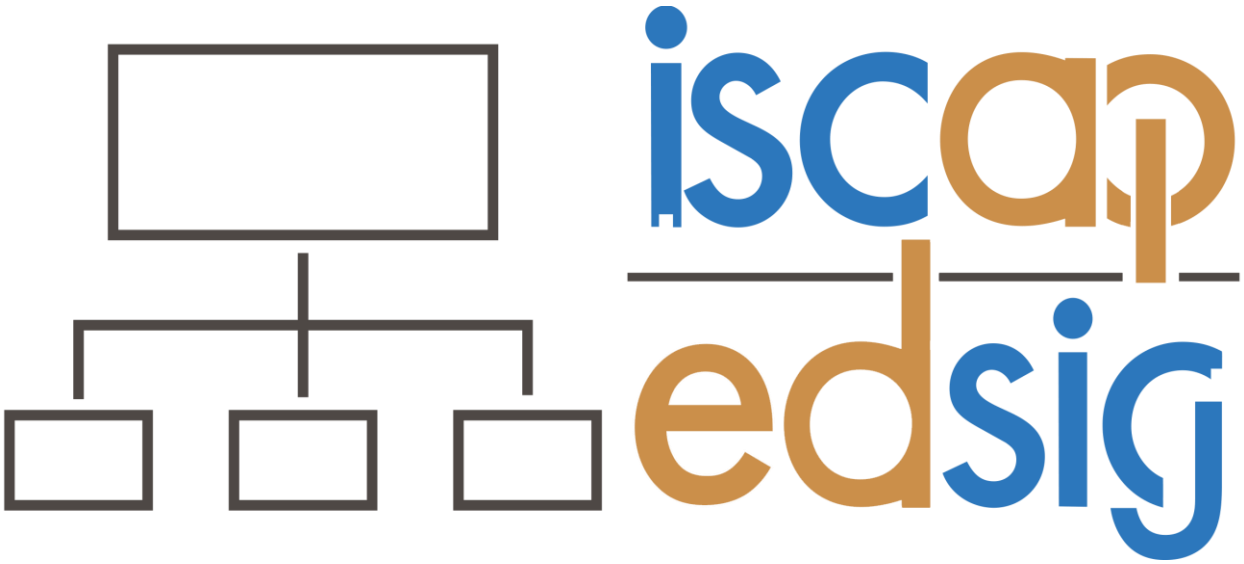
Chapter	Topic	Learning Objectives	Instructions to Students for In-Class Activities
9	Business intelligence	• List strategic advantages of business intelligence • Categorize communications as push or pull • Define big data	1a. Discussion. Which of these companies have you heard of, and why? Blockbuster vs. Netflix. Barnes & Noble vs. Borders. 1b. In pair, rank the 4 companies by how much or little you suspect they use Business Intelligence in their strategic operations. 2. Identify communications in list as push or pull. Explain. 3. Discussion. Is the current enthusiasm for big data just a fad?
10	Security	• Define common terms in information security • List 2 types of malware that might affect operations • Explain how information security breaches may affect a company's public image	1. TPS. Can you label the diagram Fig 10-1 showing threat, loss, vulnerability, safeguard, target? Can you think of an example of each item? 2. Discussion. Why might companies hesitate to report data losses and security breaches? Why don't they report vulnerabilities until they're patched? 3. Team work. Find information about one of the categories of malware. What is it? Has it been discussed in the news recently?
11	Management	• Identify one or more organizational structures • Conduct job research on LinkedIn • Define what outsourcing means and why companies use it	1. TPS. Pick a major company. Find an example of an org chart from this company showing IS and/or IT functions. With your partner compare the charts. What do they have in common? What are different? 2. TPS. Select one of the job titles listed and search LinkedIn for an opening. With partner, discuss the positions, where are they located. Are you qualified or plan to be soon? If not interested in this career, think about how this class will help you work with that person in the future. 3. Discussion. Will economics drive most US companies to outsource routine development to other countries?
12	Systems Development	• Identify SDLC components • Gather basic requirements from a client for a project • Draw and label the project management triple constraint • Explain how Parkinson's and Murphy's Law interact on a project • Identify a Gantt chart	1. TPS. Search for examples of SDLC waterfall. Do they look same or different from book? 2a. Requirements gathering exercise. Pick a partner. Interview them about their requirements for a Super Bowl party or a wedding. Write these down on a piece of paper that can be collected. 2b. Instructor swaps papers among different pairs. Can you plan this event without asking for further clarification? Why or why not? How might you have collected better requirements? 3. TPS. In your notes, draw and label the triple constraint triangle. 4. Discussion. Do Parkinson's and Murphy's Laws conflict? How do they work together or against each other? 5. TPS. Search for examples of Gantt charts. What do you think?

Appendix D. Sample 75-Minute Class Schedule

Time Required	Lesson Planned
5 min	Brief reading quiz administered individually on first day of material and as a team on second day of material
10-15 min	Introduce day's material and present about 1/3 of lecture
5-10 min	Activity related to the material
10-15 min	Present next 1/3 of lecture
5-10 min	Activity related to the material
10-15 min	Present last 1/3 of lecture
5-10 min	Activity related to the material
5 min	Homework reminders, answer questions, allow students time to get to next class, flex time in case lecture and activities run over
75 min	Total time

Appendix E. Sample 50-Minute Class Schedule

Time Required	Lesson Planned
10 min	Reading quiz administered individually on first day of material
10-15 min	Team quiz activity
5 min	Discuss quiz questions
10-15 min	Present mini-lecture prioritizing content missed on quizzes
5-10 min	Activity related to the material
5 min	Homework reminders, answer questions, allow students time to get to next class, flex time in case lecture and activities run over
50 min	Total time



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