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TiPS for Surviving Pandemic Teaching: A Learner-Centered Framework

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Abstract

The COVID-19 pandemic in Spring 2020 necessitated a sudden shift to online learning. Faculty at Saint Michael's College, in Colchester, Vermont (USA), had ten days to re-plan their courses as well as potentially learn new pedagogies, adapt to technology for instruction, and help students adjust to the changes. In addition, faculty needed to prepare for the likelihood of at least some online teaching in Fall 2020. Applying a structured approach to course design for online and hybrid instruction was accomplished for the authors' courses in business administration, computer science, and information systems by reworking a framework derived from the first author's previous research. This paper explains the framework and offers examples of class projects and assignments that were effective in achieving learning outcomes for both the remainder of the online Spring 2020 and the online and hybrid Fall 2020 semester. Successes and challenges from this application and ideas for future research are discussed.

Keywords: Course design, framework, COVID-19, course projects, sample assignments

1. SUDDEN SHIFT TO ONLINE

The public health emergency in March 2020 required Saint Michael's College's administration to make expeditious decisions for faculty to teach and students to learn safely in the face of a fast-moving deadly virus (Jasick & Redden, 2020; WHO Timeline, n.d.). Saint Michael's is a Catholic, residential, small liberal arts college, located in Vermont (USA). We offer 39 majors in 19 fields of study, including Business Administration, Computer Science, Data Science, and Information Systems. Business Administration is the College's most popular major, representing 20% of the 1,500 student enrollment. Information Systems and Data Science majors are inter-disciplinary offerings where the core courses are drawn from Computer Science and Business Administration or Computer Science and Statistics, respectively.

Due to the COVID-19 pandemic, higher Education changed instantly (Jaschik & Redden, 2020), and faculty, many of whom had never taught online, had 10 days during the semester's spring break to take their fully residential, in-person (i.e., Face-to-Face or F2F) classes online using instructional technology tools, video conferencing applications, and Canvas by Instructure, the College's learning management system (LMS).

Whether courses are offered in person, online, or in any combination of the two, effective learning results from careful instructional design and planning (Weimer, 2013). While typical planning for online teaching is six to nine months (Hodges, Moore, Lockee, Trust & Bond, 2020), our instructional technologists arranged ongoing support for online instruction to begin following the semester's spring break. Faculty scrambled to prepare to deliver classes from home (or from

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within closed offices). Lansford (2020) and Flaherty (2020) stated that faculty needed to find ways to balance both practical and technical aspects of their work and home life. All classes at Saint Michael's remained online for the duration of Spring 2020.

The Registrar reported about 30% of the faculty and 15% of the students remained fully online for the Fall 2020 semester. Fall 2020 classes that were face-to-face followed a hybrid model, where some students were in the classroom and others attended online to accommodate state-mandated safety protocols of 6 foot spacing between people. At week 9 in Fall 2020, the College had to shift to fully online due to an increased number of COVID-19 cases.

The remainder of this paper addresses how we used a framework from previous research to shape online instruction in Spring 2020 and online and hybrid instruction in Fall 2020. The paper addresses successes and challenges of balancing instructional technology, educational process, and people (i.e., students and faculty) in business administration, computer science, and information systems courses.

The courses covered in this paper are briefly described in Table 1 below.

Course	Description
Strategic Management – Business Administration (Popovich)	Undergraduate senior-level, writing-intensive course. Discussion, experiential, & case-based. Serves as an elective for Information Systems. Two sections of 18 students both semesters.
Introduction to Computer Science (Pangborn)	Introduction to programming in Java. Spring 2020 had 27 mostly first-year students.
Computational Methods for Data Science (Pangborn)	Python language basics needed for data analytics. Spring 2020 had 22 students.
eCommerce (Pangborn)	Survey of web programming tools and related topics including electronic payment, copyright, and security. Fall 2020 had 12 students.

Table 1: Courses Spring 2020 and Fall 2020

2. PEOPLE, PROCESS, AND TECHNOLOGY

During the 10-day spring break that preceded returning to instruction in March 2020, we examined best practices (see for example, Centre for Innovation in Teaching and Learning, n.d.), reviewed course design rubrics (see for example, Canvas Course Evaluation Checklist review by Baldwin & Ching, 2019), participated in informal faculty conversations via Facebook Group pages, and learned about discipline-specific approaches and resources through the SIGCSE-listserv (Special Interest Group in CS Education). For well over a decade, many instructional models have been introduced for faculty development centering around topics such as mentoring, engagement, technology, and assessment (META) (Dittmar & McCracken, 2012) and learner-centered approaches to teaching (Weimer, 2013). Reviewing multiple models for our courses revealed several concepts to incorporate for online and hybrid learning:

- keeping a learner-centered design;
- offering project-based experiential learning;
- adapting to constantly changing instructional technology;
- supporting students in asynchronous and synchronous environments;
- retaining assessment and outcomes.

Clearly these concepts focused on the integration of students and faculty with educational processes and appropriate use of technology. The People-Process-Technology (PPT) framework proposed in Popovich's previous research, Chen & Popovich (2003), was based on the then emerging research in Customer Relationship Management (CRM) (See Figure 1).

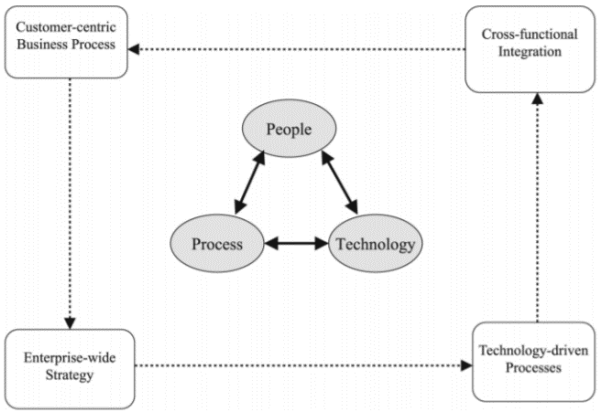

Figure 1: People-Process-Technology (PPT) Framework (Chen & Popovich, 2003).

The proposed PPT framework in the CRM paper was part of a comprehensive, cross-functional, and enterprise-wide strategy to develop innovative customer-centric and technology-driven business processes continuously aimed to fit customer needs and to optimize profitable relationships.

There was a need for a systematic, yet flexible approach to Spring 2020 online and Fall 2020 online or hybrid instruction that was innovative and adaptive (Rapanta, Botturi, Goodyear, et al., 2020), technology-driven (Bates, 2003), pedagogically sound (Tennyson & Schott, 2010), learner-focused (Weimer, 2013), and designed to achieve course learning outcomes (Dittmar & McCracken, 2012). With a few modifications, the People, Process, and Technology model described in Chen & Popovich (2003) was generalizable to the current situation of online, and hybrid education. In the adaptation, referenced as TiPS for **T**echnology (**i**nstructional), **P**edagogy, and **S**tudents/Faculty, the goal was to maximize the learning environment for students, achieve learning outcomes, and ultimately, optimize students' academic performance. The adaptation from PPT to TiPS is explained in Table 2.

PPT Framework	**TiPS Framework**
People	***Students and Faculty***
Process	The learning process is accomplished through ***Pedagogy***
Technology	***Instructional Technology*** tools available to faculty to design, implement, and evaluate courses.
Customer-centric business process	**Learner-centered**
Enterprise-wide strategy	**Department & course learning outcomes**
Technology-driven processes	**Technology-enabled**
Cross-functional Integration	**Integration of theory to practice**

Table 2: PPT to TiPS

The adapted TiPS model is shown in Figure 2.

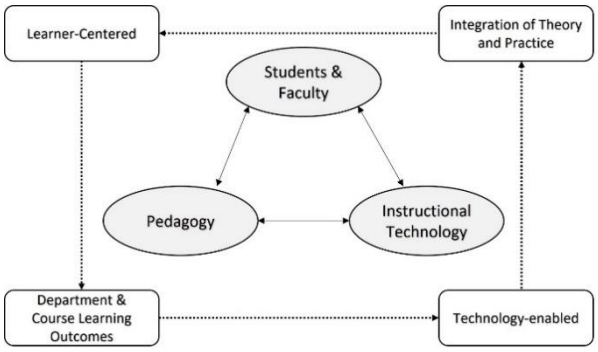

Figure 2: TiPS: Technology (instructional), Pedagogy, Students & Faculty

In summary, the adapted framework integrates three principal components: Students and Faculty, Pedagogy, and Instructional technology. Balancing the three components requires a learner-centered approach to achieve department and course learning outcomes through technology-enabled tools, and assignments and projects that apply theory to practice. The arrows in the model, like Chen & Popovich (2003), indicate a philosophy of continuous evaluation and improvement. The next section explains each component in the framework.

3. TiPS Framework

Approaching the switch to online for Spring 2020 and recognizing that the upcoming Fall semester was likely to be a mix of hybrid or fully online, it was important to discover ways to foster better teaching and learning (Adkins & Tu, 2021). With an eye towards creative opportunity and a desire to focus on innovation, the adapted model inspired research and learning to build effective courses to help students achieve established learning outcomes.

People: Students & Faculty

Hodges et al. (2020) concluded that the migration to online learning created disruptions to students, staff, and faculty lives outside the educational institution. Faculty had to consider a number of factors, such as class size, learning objectives, and content, to determine whether synchronous or asynchronous learning was more effective for their courses. In addition, the choice was also influenced by students' personal situations, which may have been challenged by varying technical skills, access to technology, connectivity, work and family obligations, physical learning environment, and individual learning styles. Deadlines, policies, and assignments all required flexibility. Faculty had to balance teaching, research, and service obligations and quite

possibly had to learn completely new pedagogies and techniques to implement digital technologies (Rapanta et al., 2020). A disadvantage of online learning is the lack of F2F instruction, so configuring the learning environment to foster exchange of ideas and information requires faculty buy-in and a strong organizational structure (Sagheb-Tehrani, 2009). Chen & Popovich (2003) had noted the importance of top management support and a commitment to CRM throughout the organization.

Weimer (2013) distinguished "learner-centered" from "student-centered" to keep the focus away from the notion of students merely being "customers" (see also Searcy, 2017). Instead, Weimer (2013) placed the focus on students as "learners," who were supported by practices and policies that directly affected learning. There was no shortage of tips (i.e., Bates, 2003) or instructional design models (i.e., Tennyson & Schott, 2010 and Brookfield, 2017) to assist faculty in their course design and assessment.

Additionally, faculty and students had to adjust to physical and emotional conditions and constraints. It was not even clear that the online environment was conducive to learning (Lederman, 2020). Boardman, Vargas, Cotler, & Burshteyn (2021) surveyed students on performance and feelings of connectedness to peers and faculty in their online classes. Their small sample determined that feeling connected to peers decreased after switching to online learning. Within the adapted TiPS model, our courses addressed the challenges students and faculty faced by keeping a learner-centered focus on design, implementation, assessment, and revision.

Process: Pedagogy

According to Chen & Popovich (2003), CRM systems allowed companies to integrate business processes to understand and respond to market changes. Selecting from a combination of potential instructional materials (i.e., videos, recorded lectures, homework problems, readings, and programming lab assignments) and types of interactions (i.e., discussions, presentations, virtual break out rooms, and peer reviews) required matching content knowledge to department and course learning outcomes. These efforts often required ongoing flexibility and immediate adjustment (Coman, Tiru, Mesesan-Schmitz, et al., 2020). In addition, clearly communicating requirements to students, often via multiple channels, was key to staying aware of evolving student needs (Rapanta et al., 2020). In a recent review, Adkins & Tu (2021) identified both successes and challenges to the sudden shift to online learning. A key takeaway: there is no one-size-fits-all model for the successful switch. Keeping students (learners) at the center of the course, learning to modify (or simplify) expectations, helping students adapt to technology, and allowing them to participate actively in their learning processes are considerations for course structure and design when shifting to online learning (Adkins & Tu 2021, Rapanta et al., 2020).

The expectation that the liberal arts will provide a return on investment and real-life work experiences has been repeatedly discussed in the literature (Cole, 2012; AACU&Y News, 2020). Pre-COVID-19, the Strategic Management course had already integrated instructional technology tools with project-based learning. A benefit of project-based learning for students is the integration of theory and practice which allows authentic opportunities for them to gain knowledge, work independently, and gain critical skills potential employers seek (i.e., Rice & Shannon, 2016). In preparing for online instruction, planned, semester-long experiential-based projects had to be adapted. However, it was important for projects to remain focused on learning outcomes that advanced students' professional development as well developed their critical thinking, problem-solving, and communication skills. For example, one pre-COVID-19 project required field interviews with managers. Since organizations were occupied taking immediate actions to protect employees, establishing response teams, keeping contact with customers, ensuring their own liquidity, stabilizing the supply chain, developing contingency plans, and demonstrating purpose (Staples, 2020), it seemed prudent to not add additional networking requests by students. However, creating opportunities for discussion on business responses to COVID-19 was a way to adapt and approach revised assignments. See a sample discussion topic in Appendix 2.

Technology: Instructional Technology

The College adopted Zoom video conferencing software. Khare & Popovich (2021) published a classroom decision-based case on the switch to online instruction, Zoom's explosive growth, and best practices for video-conferencing. In Chen & Popovich (2003), information technology optimized interactions both internally and externally. A goal our instructional technologists set for faculty was to consider whether and how instructional technology could support learning outcomes. For example, in the Computer Science

courses, consideration was given to appropriate communication tools. Slack, with persistent chat rooms organized by topic, private groups, and direct messaging (https://slack.com), was selected to streamline communication for online students. While it was yet another piece of software to adopt, students were receptive to it because it was a common industry tool.

Recent surveys of executives regarding student skills in a post-pandemic workplace (i.e., Lieberman, 2021) indicate that in addition to problem-solving, critical thinking, innovation, creativity, agility, empathy, flexibility, and growth mindsets, there is increased demand for using tools that facilitate human connection and collaboration. Digital fluency was also included as important to acquiring and keeping jobs. Being able to "combine" and "manipulate" information to solve complex problems have "tremendous value in the hiring market" (Chau, 2019). Within the adapted TiPS model, it is important to NOT assume that students are familiar or comfortable with the various instructional technologies. Allowing time to ask questions and offering resources on how to use the tools effectively are important. The Strategic Management course included video introductions to all instructional technology tools in play.

Continuous Improvement

The arrows in the TiPS model indicate continuous improvement through evaluation and revision. Chen & Popovich (2003) identified an ongoing evaluation loop around the entire CRM process: from design to feedback to evaluation. Instructional design is also a continual process. One model to consider is ADDIE (Analyze, Design, Develop, Implement and Evaluate) (i.e., see Kurt, 2017 for an overview of ADDIE). The TiPS evaluation process recognizes that Instructors often make incremental revisions and on-the-fly modification, especially for online learning. Another key takeaway is that what works really well one day, such as a collaborative discussion, may be ineffective the next. The TiPS framework recognizes the changing needs of learners and offers faculty flexibility in the design and regular reflection of progress towards learning outcomes. Instructors who demonstrate a genuine commitment to learning motivate students and impact their learning (Weimer, 2013). In the Spring 2020 section of Intro to Computer Science, having students work on practice problems in Zoom break out rooms completely bombed; the students were disengaged, and the instructor was out of the loop. Two simple fixes implemented in the subsequent offering made a tremendous difference:

1. Students worked in Google Docs which allowed the instructor to observe progress and to engage with students to offer real-time hints and feedback, and
2. At the start of each session the students were asked to adopt roles including facilitator, scribe, and reporter (whose task was to send a de-brief email to the instructor).

The second strategy came from pedagogical resources on Process Oriented Guided Inquiry Learning (Hu, Mayfield & Pearce, 2017).

4. PUTTING TiPS TO WORK

Some of our faculty were fortunate in having had experience teaching online from summer programs or from other institutional experience. Norton & Hathaway (2015) note that some faculty gain insight from observing their own online teachers. Many of our faculty relied upon the College's instructional technologists for assistance. College faculty decided whether synchronous or asynchronous models, or a blending of these modalities worked for their outcomes and students' needs. Sections of Strategic Management used a combination of synchronous in-class meetings via Zoom, and asynchronous individual and collaborative group assignments and projects during both semesters. In the Computer Science courses, classes were synchronous, though some days were a brief lecture followed by independent lab work. Boardman et al. (2021) noted that students, overall, felt more connected to professors after the switch to online learning. When participants in Boardman et al. (2021) were asked what tools helped them to feel more connected to their peers and their professors, the most helpful tool reported was Zoom.

When classes resumed in mid-March 2020, the environment could be described as chaotic and stressful. Students were riding an emotional rollercoaster of worries. Additionally, every course they were taking was set-up differently. It was also clear their faculty had different comfort levels with online teaching and the instructional technology tools. The authors' courses were already "heavy users" of Canvas, in that even prior to the pandemic, we made regular use of instructional technology tools (such as publisher and instructor content, video capture, discussion boards, solution sets, and detailed programming samples). The start of Fall 2020 was also a challenging time as students had to adjust to taking classes which were a combination of online, face-to-face, and hybrid.

On March 19, 2020, it was almost like the first day of class, all over again. Each instructor had to explain the systematic approach taken to redesign their courses. We reviewed the revised syllabus. In the Strategic Management course, some assignments that were not as critical to learning outcomes were simply dropped, and others received significant revisions to adapt to our new learning environment. Using Zoom's breakout rooms, in-class "project workdays" were added to the schedule. Typical lecture content was moved to video with either out of class written or video discussion boards or in-class small breakout room group discussions with "lessons learned" shared to the entire class. However, we stayed true to the course learning outcomes, with an emphasis on applying practice to theory.

A student commented, "the flexibility of the professor and her desire to see us succeed is what was really most effective. I appreciated the built-in workdays to collaborate on projects and presentations with peers."

The assessment components for the Computer Science courses had to be significantly reworked because they contained closed book in-class exams and finals. The software for supervising exams would not have been feasible for students with poor internet connections, and the instructor was also concerned with the privacy implications of this software. The instructor also wanted to avoid assignments that would increase the temptation for academic integrity violations, and therefore favored open-book assignments, additional opportunities for collaboration, and more low-stakes feedback. This redesign made a deliberate tradeoff to try to maximize learning at the expense of a possible compression of the final grade distribution. This approach seemed to work well; one student noted: "She allowed for a lot more collaboration among students which was great because it showed me that she really just wanted to make sure that we continued to learn despite the circumstances."

5. TiPS IN Action

The following offers a review of assignments and projects during the two-semester period. Each assignment indicates its focus on the balance of students/faculty, pedagogy, and instructional technology. These assignments can be adapted to a variety of courses and course levels.

Connections – Focus on Students
The Liberal Arts College experience promotes community relationships and close connections between students and faculty members. That connection was immediately changed with the start of the Pandemic. Virtual connections and various communications with students were frequent and deliberate. A Strategic Management student wrote, "Even though it was a lot of work, what helped was that the professor knew how to navigate the online class and teaching atmosphere. The breakout check-in discussions at the beginning of class gave me peace of mind knowing there was support for me if I needed it."

Post-Class Check-ins – Focus on Students
In the Computer-Science courses, students were asked to complete a check-in following each lecture. In the first check-in the instructor solicited information about concerns regarding resources and connectivity needed to continue the semester remotely. For the first few weeks the students were asked to indicate:

- Progress on their coursework
- Challenges with the material or other logistics
- What worked well or was particularly interesting.

After a couple weeks the prompt was changed to give the option of entering "no news" (which was taken to be good news). The instructor always answered these check-ins later that evening, and for the students who were interested in more conversation outside of the class, this proved a nice venue for that correspondence.

Collaborative Check-ins – Focus on Students
In Strategic Management, on that "first" day in March 2020, and in every synchronous class period thereafter, the first order of business, ranging from 10 to 15 minutes, was to have small group check-ins and an opening collaborative assignment using one of the applications from Microsoft Office 365. Casual discussion at the start of synchronous classes was also recommended by Boardman et al. (2021) stating that students felt motivated in online classes when assigned discussions and group work.

Students were assigned to randomly or pre-set breakout rooms with the suggestion to first "Take 3 minutes" to:

- share a good or happy event or news
- describe a challenge, struggle, or concern
- offer support to one another

Students evaluated the courses highly and commented in evaluations that they appreciated the caring and supportive environment created, which allowed people to connect, even though we were online.

One student stated, "the professor acknowledged that we may be struggling with adjusting to the new ways of classes. This was helpful as we had to move back home and adjust to home life. By getting us talking in small groups on how we were doing, it was encouraging."

Short Written Assignments & Peer reviews – Focus on Pedagogy

In Strategic Management, students analyzed secondary research to write a one-to-two page, single-spaced executive summary for each of three assignments, which when put together formed a case analysis for a selected company. For this project, students were divided into three different teams of six for the purpose of peer review. Each team was assigned a large public company from a list of options; the teams and the selected company remained the same for three writing assignments. Students were encouraged to communicate with one another and to help each other research and organize each of the short papers. The instructor expected students to submit their own work. Appendix 2 describes each writing assignment.

Each student was tasked with peer reviewing the other five people in their team. Assigning peer reviews in Canvas grants access to the peers' submitted files and students can add comments and attach files for each peer. A company-specific rubric was provided to the students. Following the due date, students had at least four days to read their peers' papers and offer substantive, productive comments on the rubric by the next class period. After reviews were submitted, we used breakout rooms for each group to discuss "what was done well," "what could use improvement," and "what did you learn for the next assignment." These "lessons learned" were then shared with the larger class in the main discussion room.

Analyzing the scores from four semesters –two without peer reviews and two with the peer review process– identified a positive, statistically significant difference in graded papers for the courses with the peer reviews (Popovich, *in preparation*). Students commented that they appreciated the opportunity to improve their grade with each short paper and to hear from others. A few students also mentioned spending more time editing because "peers would review their work." An additional comment mentioned "our small group built a learning environment that was both positive and collaborative."

Pandemic Strategy Project – Focus on Pedagogy

The pre-COVID-19 comprehensive project in Strategic Management was to have students, in small teams, build their professional network and meet a business executive or business professional in an executive leadership role. The project, approximately 30% of the final grade, was designed for students to witness how strategic management theories were actually practiced. After studying the selected company, the student team would then interview the professional. Finally, the team would moderate a live, 30 to 45 minute in-class video conference as a panel presentation with prepared questions asked to the business professional. A final presentation would include a written analysis as well as a reflection on lessons learned. Students were encouraged to search out companies and individuals that were aligned with their own career interests.

The project's experiential component with the business executive had to be canceled due to business professionals managing their own COVID-19 crisis situations. Instead, we adapted the project to focus on what businesses were doing to manage the crisis. The assignment was called "Pandemic Strategy." The project evaluation was re-weighted to account for 15% of the final grade, rather than the 30% originally assigned. New, shorter, collaborative video projects and discussions were put in its place. Students in both semesters were creative with these projects and were able to apply benchmarks for comparisons within the industry.

Programming Projects – Focus on Pedagogy

While compassion was crucial at the start of the pandemic, the students still deserved ample opportunities to master the course material. In particular, the instructor was concerned that students have skills to succeed in subsequent courses that relied on the material. The revised syllabus included "short assignments" where the programs were to be completed during the class periods. These programs were collected so the instructor could provide the feedback that would normally be provided informally in the lab. The instructor also added some zybooks reading assignments (with integrated activities) when the company generously made materials freely available for emergency remote (online) learning.

The normal weekly programming assignments were maintained, but students were explicitly encouraged to collaborate. Communication was crucial for minimizing student frustration, and

students were appreciative of this work. "She made herself available on Zoom, Slack, and e-mail during our class periods. While working on assignments, if I had a quick question or needed more explanation, I could send her a message and she'd get back immediately. She also had us check in with her after every class to just give her an update on how we were doing." The assignment write-ups were also expanded to pre-emptively include sample code, hints, and answers to questions that were most likely to arise in the lab period.

Creative Discussion Boards & "Our Take" Lecturettes – Focus on Instructional Technology

The Business Administration department had, several years ago, designed "Guidelines for Effective Discussion Board Participation" for use in summer online courses (see Appendix 3). Included in the guidelines is the requirement to follow a structured routine for all discussion board assignments:

- **POST** to the board by a certain date;
- **RESPOND** to the posts of a pre-determined group; by a certain date; and
- **REPLY** to all those that took time to write a comment to their post by the time the board closed.

The **POST-RESPOND-REPLY** cycle is repeated for all discussions. Students appreciate the routine of established due dates for each segment. In addition, these guidelines removed frustration felt by the students who posted their answers in a timely fashion and then had to wait for others who seemed to always post just as the discussion closed. Finally, the **REPLY** portion verified engagement when students took time to read what other students took time to write.

A faculty colleague was invited to record "Our Take" lecturettes as an alternative to a traditional single-instructor recorded lecture. Each "Our Take" was approximately 15-to-25-minute conversational overviews of the assigned readings which ended with our impressions on how the readings/theory applied to the business world. Students enjoyed the dialog of these brief before-class videos and in class were assigned to small groups to answer several questions about the readings.

Integration of Theory and Practice – Creating Balance with TiPS

Our over-arching teaching objective is to help students develop into graduates who bring their heads and hearts to work and recognize the value of being life-long learners. Part of this process is for students to enhance their abilities to assess situations from a variety of lenses from their liberal arts studies, to offer recommendations, and to evaluate their actions within a larger social context. Brookfield (2017) addressed critically reflective teaching from four complementary lenses: students' eyes, colleagues' perceptions, theory, and personal experience. His definition of critical reflection was the sustained and intentional process of identifying and checking the accuracy and validity of our teaching assumptions. Brookfield (2017) suggested we need to examine our assumptions, constantly inquire, and practice our work through the four lenses.

All assignments in our courses are attached to course learning outcomes which are matched to department learning outcomes. We examine our courses through four cornerstone touchpoints: student evaluations; faculty observation and pedagogy discussions; networking with business and community leaders; and alumni connections. These touchpoints allow us to evaluate how projects and assignments integrate theory with current business practice and trends. Using the TiPS framework helped us to balance course design, outcomes, assignments, and assessments from the viewpoint of a critically reflective teacher (Brookfield, 2017).

6. ADAPTING TiPS TO OTHER COURSES

There are numerous instructional design models to choose from in the research within business and computer science sub-areas as well as general higher education fields (i.e., Tennyson & Schott, 2010). While all models offer general guidelines to organize pedagogical content to achieve outcomes, the TiPS framework, with its emphasis on learner-centered approaches to match pedagogy to learning outcomes enabled through instructional technology, can be easily adapted to any introductory, lecture, discussion, programming, or writing-based course. Keeping TiPS in mind allowed us to make quick adjustments in an unprecedented environment where student needs seemed to change by the moment. The framework allowed us to adapt to different student learning styles and implement multiple methods to achieve our learning outcomes.

7. LIMITATIONS & FUTURE DIRECTIONS

The People-Process-Technology framework in Chen & Popovich (2003) focused on improved profitability with a cross-functional, enterprise-

wide strategy to optimize customer-centric and technology-driven processes. The TiPS framework offers a dynamic model for faculty by keeping a learner-centered focus that balances technology and pedagogy for the sudden switch to online education and the intentional online and hybrid planning for Fall 2020 (and beyond). The pandemic pushed Higher Education to assess their online learning programs and resources. Designing, developing, and evaluating online content, regardless of delivery mode, creates opportunity for faculty to collaborate and learn from each other.

Instructors with less experience with instructional technology tools may feel that TiPS requires additional support and training before adapting the framework in their courses. TiPS as a framework needs further research to determine its efficacy and its potential impact on students' academic performance. The next step for this research is to introduce TiPS to other faculty and determine how the model can be implemented in other courses from our respective programs as well as in other academic disciplines.

In some ways, 'Pandemic teaching' has taught us a lot and hopefully made us better instructors, but we welcome the opportunity to again share cookies or a meal to solidify our connections to our learning community.

8. REFERENCES

Adkins, J., & Tu, C. (2021). Online teaching effectiveness: A case study of online 4-week classes in a graduate information systems program. *Information Systems Education Journal (ISEDJ). 19(3).* 31-37.

AAC&U News. (2020, February). Liberal Arts Colleges Have Excellent Return on Investment, but Economic Challenges Could Persist for Low-Income Students. Association of American Colleges & Universities. Retrieved April 1, 2022 from https://www.aacu.org/article/liberal-arts-colleges-have-excellent-return-on-investment-but-economic-challenges-could-persist-for-low-income-students

Baldwin, S. J., & Ching, Y.-H. (2019). Online Course Design: A Review of the Canvas Course Evaluation Checklist. *The International Review of Research in Open and Distributed Learning*, 20(3). Retrieved April 1, 2022 from https://doi.org/10.19173/irrodl.v20i3.4283

Bates, A. W., & Poole, G. (2003). Effective teaching with technology in higher education. San Francisco: Jossey-Bass.

Boardman, K., Vargas, S., Cotler, J., & Burshteyn, D. (2021). Effects of emergency online learning during COVID-19 pandemic on student performance and connectedness. *Information Systems Education Journal*, 19(4) pp 23-36.

Brookfield, S. D. (2017). Becoming a Critically Reflective Teacher (2nd ed.). Jossey-Bass.

Centre for innovation in Teaching and Learning. (n.d.). Welcome. Retrieved April 1, 2022 from https://blog.citl.mun.ca/instructionalresources/?_ga=2.136383475.2123100180.1630942053-1971026628.1630942053

Chen, I.J., & Popovich, K. (2003), Understanding Customer Relationship Management (CRM): People, Process and Technology. *Business Process Management Journal,* 9(5), pp. 672-688.

Chau, J. (2019, April 11). What Do Employers Want from Business Graduates? Mba.Com. Retrieved April 1, 2022 from https://www.mba.com/business-school-and-careers/career-possibilities/what-do-employers-want-from-business-grads

Cole, J. (2012). The Great American University: Its Rise to Preeminence, Its Indispensable National Role, Why It Must Be Protected. *Public Affairs*. New York.

Coman, C., Tiru, L., Mesesan-Schmitz, L., Stanciu, C., & Bularca, M. (2020, December). Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective. *Sustainability.* 12*.* Retrieved April 1, 2022 from https://doi:10.3390/su122410367

Dittmar, E., & McCracken, H. (2012). Promoting Continuous Quality Improvement in Online Teaching: The META Model. *Journal of Asynchronous Learning Networks*, 16(2), pp. 163–175.

Flaherty, C. (2020, March 24). Faculty Home Work. Retrieved April 1, 2022 from https://www.insidehighered.com/news/2020/03/24/working-home-during-covid-19-proves-challenging-faculty-members

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, March 27). The Difference Between Emergency Remote Teaching and Online Learning. EDUCAUSE. Retrieved April 1, 2022 from

https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Hu, H., Mayfield, C., & Pearce, J. (2017). Special Session: Converting Your Teaching (or Even Your Whole Department!) to Active Learning via POGIL. In *Proceedings of the 2017 ACM SIGCSE Technical Symposium on Computer Science Education* (*SIGCSE '17*). Association for Computing Machinery, New York, NY, USA, 687–688. Retrieved April 1, 2022 from DOI:https://doi.org/10.1145/3017680.3017805

Jaschik S., & Redden, E. (Eds). (2020). How COVID-19 is Changing Higher Education. Retrieved April 1, 2022 from https://www.insidehighered.com/sites/default/server_files/media/ETS%20coronavirus%20webcast.pdf

Khare, V., & Popovich, K. (2021). Sudden switch to remote instruction: Managing a crisis in a Zoom world. *Journal of Case Studies*, 39(1).

Kurt, S. (2017). ADDIE Model: Instructional Design. *Educational Technology*, August 29, 2017. Retrieved from https://educationaltechnology.net/the-addie-model-instructional-design/

Lansford, J. (2020). 5 Strategies for Balancing Work and Family During COVID. Retrieved April 1, 2022 from https://www.psychologytoday.com/us/blog/parenting-and-culture/202009/5-strategies-balancing-work-and-family-during-covid

Lederman, D. (2020, August 26). Early Dispatches From the COVID-19 Classroom. Retrieved April 1, 2022 from https://www.insidehighered.com/digital-learning/article/2020/08/26/professors-describe-their-experiences-covid-19-classroom-fall

Lieberman, M. (2021, May 3). Top U.S. Companies: These Are the Skills Students Need in a Post-Pandemic World. Education Week. Retrieved April 1, 2022 from https://www.edweek.org/technology/top-u-s-companies-these-are-the-skills-students-need-in-a-post-pandemic-world/2021/03

Norton, P., & Hathaway, D. (2015). Teachers' online experience: Is there a covert curriculum in online professional development? *Journal of Technology and Teacher Education*, 23, pp. 509–533.

Popovich, K. (in preparation). Peer review improves writing scores in a writing-intensive course: An assessment of Business Strategy.

Rapanta, C., Botturi, L., Goodyear, P., et al. (2020). Online University Teaching During and After the Covid-19 Crisis: Refocusing Teacher Presence and Learning Activity. *Postdigital Science & Education, 2,* 923–945.

Rice, M., & Shannon, L. Y. (2016). Developing Project Based Learning, Integrated Courses from Two Different Colleges at an Institution of Higher Education: An Overview of the Processes, Challenges, and Lessons Learned. *Information Systems Education Journal,* 14(3). pp 55-62.

Sagheb-Tehrani, M. (2009). The Results of Online Teaching: A Case Study. *Information Systems Education Journal,* 7(42), pp. 3-9.

Searcy, Y. D. (2017, June 5). Higher ed should view the public, not the student, as the customer. Inside Higher Ed. Retrieved April 1, 2022 from https://www.insidehighered.com/views/2017/06/05/higher-ed-should-view-public-not-student-customer-essay

Staples, M. (2020, March 9). COVID-19: Implications for business in 2020. Briefing note #2. McKinsey & Company. Retrieved April 1, 2022 from https://www.mckinsey.com/business-functions/risk-and-resilience/our-insights/covid-19-implications-for-business-2020#

Tennyson, R. D., & Schott, F. (2010). Instructional design theory, research, and models. In R. D. Tennyson, F. Schott, N. M. Seel, & S. Dijkstra (Eds.), *Instructional design: international perspectives, Theory, research and models*, Vol. 1, pp. 1–18. New York: Routledge.

Weimer, M. (2013). Learner-Centered Teaching: Five Key Changes to Practice (2nd ed.). Jossey-Bass.

World Health Organization (WHO). (n.d.) Timeline: WHO's COVID-19 response. Retrieved April 1, 2022 from https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline?gclid=CjwKCAjwn6GGBhADEiwAruUcKohtw9kyx2rWFMjGKIL31_QnDK6hvAvi4irO4hQBVhtgjQRWCbvb5BoCwfgQAvD_BwE#event-0

Appendix 1

Source: McKinsey's Briefing note #2, March 9, 2020. See references (Staples, 2020) for the link.

Learning Objectives:

1. Analyze organizational context, strategy, operations, processes, and performance; and
2. Identify and analyze current business practice responses to the COVID-19 pandemic

Directions:

1. Join one of seven breakout rooms in Zoom, each room number is associated with a response/action number in the table below.
2. Review the Briefing Note #2 article, discuss with your group, and give supporting examples of your assigned response/action.
3. Prepare 1-2 slides on your findings
4. We have 15 minutes to prepare this discussion
5. Share with the class in the main Zoom session

COVID-19 response: Companies can draw on seven sets of immediate actions.

1. **Protect employees**
   - ✓ Follow the most conservative guidelines from leading health authorities (e.g., CDC, WHO)
   - ✓ Communicate with employees frequently and with specificity; support affected employees.
   - ✓ Benchmark your efforts to determine the right policies and levels of support
2. **Set up cross-functional response team**
   - ✓ Overall lead should be at the CEO or CEO-1 level; team should be cross-functional and dedicated
   - ✓ Create 5 workstreams: (a) employees; (b) financial stress-testing and contingency planning; (c) supply chain; (d) marketing and sales; (e) other relevant constituencies
   - ✓ Define specific, rolling 48-hour and 1-week goals for each work stream based on planning scenarios
   - ✓ Ensure a simple but well managed operating cadence that is output and decision focused.
   - ✓ Present minimum viable products with milestones and progress dashboards as well as a trigger and threat map
3. **Test for stress, ensure liquidity, and build a contingency plan**
   - ✓ Define scenarios that are tailored to the company.
   - ✓ Identify variables that will affect revenue and costs. Use analytics and expert scenarios
   - ✓ Model cash flow, P&L, and balance sheet in each scenario
   - ✓ Identify moves to stabilize organization in each scenario
4. **Stabilize the supply chain**
   - ✓ Define extent and timing of exposure to areas that are experience community transmissions (tier -1, -2, -3 suppliers, inventory levels)
   - ✓ Immediate stabilization (ration critical parts, optimize alternatives, pre-book air/freight capacity, increase priority in supplier production, offer supplier support
   - ✓ Medium/longer term stabilization (updated demand planning and network optimization) drive resilience in supply chain network
5. **Stay close to customers**
   - ✓ Immediate stabilization (inventory planning, near-term pricing, discounts)
   - ✓ Medium/longer term stabilization (investment and priority targets for long-term growth)
6. **Practice plan with top team through in-depth tabletop exercise**
   - ✓ Define activation protocol for different phases of response (contingency planning only, full-scale response, other)
   - ✓ Key considerations: clarity on decision owner (ideally a single leader), roles for each top-team member, "elephant in the room" that may slow response, actions, and investment needed to carry out plan
7. **Demonstrate purpose**
   - ✓ Support epidemic efforts were possible
   - ✓ Retool manufacturing (e.g., produce PPE)

Appendix 2

Strategic Management Short Written Assignments & Peer reviews.

Description
Each group of six students will be assigned a public company. Using the strategy tools and frameworks discussed in class, three short topic research papers will address (1) What is the company's present situation; (2) Where does the company want to go; and (3) How should it get there? Together, the topic papers provide the basis of a company analysis to assess a company's current strategy, its superior profitability, and its sustainable competitive advantage.

Following submission in Canvas, peer reviews are assigned, and students are to complete a peer review rubric with formative comments for each assigned review. We will debrief the peer reviews at the next class period following the assignment's due date.

Learning Objectives:
1. Apply tools and frameworks by analyzing a selected company's business strategy
2. Offer critical and professional feedback for peers
3. Apply "lessons learned" to future writing assignments

Grading:
- Topic 1: 5% of the total grade. Value 100 points. 75 points assigned to the paper and 25 points assigned to the peer reviews.
- Topic 2: 7% of the total grade. Value 100 points. 75 points assigned to the paper and 25 points assigned to the peer reviews.
- Topic 3: 8% of the total grade. Value 100 points. 75 points assigned to the paper and 25 points assigned to the peer reviews.

Topic Descriptions:

Assignment Topic	**Brief Description**
Topic 1 SWOT/Mission/Vision/ Sustainability	Conduct a *SWOT* analysis and summarize your findings. Evaluate the company's mission/vision and sustainability efforts. Evaluate whether the company has a sustainable competitive advantage and demonstrates superior profitability. *SWOT* (strengths, weakness, opportunities, and threats)
Topic 2 External Analysis	Analyze the company's industry with a macro analysis such as *PESTLE* and Porter's Five Forces. Analyze the competitive marketplace with benchmarking. Does your research suggest that the firm's competitive strategy is working? Provide evidence. *PESTLE:* (Political, Economic, Social, Technology, Legal, Environment)
Topic 3 Financial Analysis	Using 5-years of publicly available financial data, analyze the company's financial position and recent trends with ratio analysis. Make strategic recommendations based on your analysis. Include your Excel file.

Appendix 3

Guidelines for writing an effective online post

1. Each discussion involves three actions with defined due dates: **POST** your answer to the question. **RESPOND** to others. **REPLY to** those that took time to respond to you!

2. Do not procrastinate. Follow the Canvas Calendar **Post-Respond-Reply** due dates.

2. Use business language. Do not use informal or texting language. Limit first person (I, my, we, our) since the idea is to discuss theory and not to express opinion (unless asked for your opinion or reflection). Use Spell check. Suggestion: Write your post in Word or Docs first, save the file, and then copy/paste to the discussion post. Canvas can be picky, especially for Mac users.

3. Engage in the topic. You have to be "all in" to get the most out of the online learning environment. If you find you are struggling with staying focused: contact your professor(s). We will contribute to keep the discussion on pace or to change direction, but do NOT expect a regular response from the faculty: this is YOUR discussion board!

4. We do not have access to "nonverbal cues" such as nodding our heads in agreement. The online discussion is a way for you to interact and engage with the entire class. Be courteous and respectful. REMEMBER: DO NOT YELL! (i.e., use all caps).

5. Back it up! While appreciated, unless requested, discussion boards are not the place for personal opinion. You must first qualify your argument with theory and research. Using examples are critical but the examples must be evidence-based and therefore should have a citation (if from outside the text).

6. Do not copy more than 2-3 sentences from the text. We are interested in your interpretation, not the books!

7. You want to write a first post that expands the conversation. Do not just agree or disagree. All posts and responses should be meaningful.

8. Ask questions if you are confused. Especially in responses, questions help other students to formulate replies.

9. Do not over-post just to post. We do not want to impose a length requirement - it is more about substance than quantity. However, each question should have a response that is from 1-3 paragraphs and each paragraph should have 4-8 sentences. Make sure if you use bullets to use them effectively and sparingly.

10. Impress us with your academic curiosity! Look for sources outside the text to strengthen your posts, responses, and replies.

Source: Developed by the Business Administration and Accounting faculty at Saint Michael's College