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Teaching Tip

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Teaching Tip
Hands-on ERP in the Introduction to MIS Course

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ABSTRACT

Integrating experiential learning with Enterprise Resource Planning (ERP) in an introductory Management Information Systems (MIS) course is often challenging for faculty due to time, cost, and technical constraints. This paper presents a practical, hands-on ERP teaching approach grounded in experiential learning theory that addresses these barriers. We describe its implementation in an introductory MIS course, report student learning outcomes, and provide recommendations for instructors interested in adopting a similar framework.

Keywords: Enterprise resource planning (ERP), Experiential learning & education, Teaching framework, Information systems education, Exercises

1. INTRODUCTION

Most business schools require students to complete an Introduction to Management Information Systems (MIS) course to provide broad exposure to core information systems (IS) topics such as software systems, databases, networking, business process management, and business intelligence (Bačić & Shemroske, 2024; Burleson et al., 2023; Connolly & Rush, 2018; Connolly et al., 2022; Farkas et al., 2022; Hardaway & Scamell, 2005). Because IS plays a critical role in modern organizations, this course is considered essential for all business majors (Connolly & Rush, 2018). However, teaching the course effectively remains challenging because its wide scope often clashes with the diverse academic backgrounds and interests of business students (Connolly et al., 2022). To address this challenge, instructors often design active learning exercises to spark engagement and deepen understanding (Hardaway & Scamell, 2005; Hepner & Dickson, 2013; Maloni et al., 2012; Mitchell et al., 2017; Riordan et al., 2017; Shen et al., 2015).

Enterprise Resource Planning (ERP) systems represent one of the most impactful IS topics. ERP platforms integrate business processes such as inventory management, accounting, sales, customer relationship management, and human resources through a shared database that promotes consistency, efficiency, and collaboration across departments (Hepner & Dickson, 2013). The global ERP market, valued at $43.72 billion in 2020, is projected to reach $117.09 billion by 2030 (Kumar et al., 2022). As adoption grows, business students are increasingly likely to encounter ERP systems in their careers, making familiarity with these tools a valuable asset for employers (Hepner & Dickson, 2013; Lerouge & Webb,

2004; Peslak, 2005; Riordan et al., 2017; Shen et al., 2015). Moreover, because ERP spans nearly every area of business, it often resonates more directly with students' academic interests.

The IS literature underscores the importance of active, hands-on learning in introductory MIS courses (Bačić & Shemroske, 2024). Engaged learning not only improves comprehension but can also increase students' interest in pursuing MIS programs (Connolly & Rush, 2018; Firth et al., 2008). While MIS majors often gain extensive ERP experience in upper-level or capstone courses (Davis & Comeau, 2004; Peslak, 2005), non-MIS students in introductory courses may struggle to connect with ERP concepts that feel peripheral to their studies (Shen et al., 2015; Triche et al., 2024). Faculty face additional barriers such as limited training, funding constraints, and technical complexity, all of which can discourage ERP-based experiential learning (Davis & Comeau, 2004; Hepner & Dickson, 2013; Maloni et al., 2012). Scholars agree, however, that teaching ERP effectively requires more than lectures alone (Davis & Comeau, 2004; Maloni et al., 2012; Riordan et al., 2017). When courses omit hands-on ERP components, learning objectives are often not achieved (Peslak, 2005). Previous research has explored a range of experiential approaches—from case studies and role-playing (Connolly et al., 2022; Hardaway & Scamell, 2005; Lerouge & Webb, 2004; Riordan et al., 2017; Shen et al., 2015) to web-based ERP simulations (Ayyagari, 2011; Bačić & Shemroske, 2024; Burleson et al., 2023; Farkas et al., 2022; Jewer & Evermann, 2015; Kinnett & Steinbach, 2021; Triche et al., 2024)—with mixed results.

This paper presents a simple, effective approach to teaching ERP concepts through hands-on learning in the Introduction to MIS course. Building on Pridmore et al. (2014), we argue that introducing hands-on ERP experience at an introductory level improves student understanding of ERP systems while providing a broader, more practical view of the IS field. Our method leverages the cloud-based ERP software Odoo (Odoo.com) and draws on the principles of experiential learning theory (Kolb & Kolb, 2009).

The next section reviews pedagogical strategies for teaching ERP and explains why experiential learning theory underpins our approach. We then present our hands-on ERP framework, including the modules we developed and implemented at our university. Finally, we share student feedback and provide recommendations for faculty interested in adopting ERP-focused experiential learning in introductory MIS courses.

2. ERP PEDAGOGY

Instructors use a variety of pedagogical approaches to teach ERP concepts to undergraduate students, including traditional lecture-based methods and more interactive approaches such as gamification (Leyh, 2012; Wijaya, 2023), simulation (Schwade & Schubert, 2016), and project-based learning (Gerogiannis & Fitsilis, 2006). Despite growing interest in experiential methods, many instructors still rely on lectures due to cost, time, and licensing barriers that limit access to ERP software (Jheengut et al., 2020).

ERP simulations are commonly used to provide hands-on learning. These activities place students in realistic business scenarios that replicate ERP use. Leger (2006) designed a classroom simulation using mySAP ERP where student groups acted as businesses managing manufacturing, sales, and distribution. Students in this environment demonstrated stronger comprehension than those taught solely through lectures. Beranič and Heričko (2019) used the ERPsim business simulation game with graduate IT students and found that participants advanced more easily into complex material. Monk and Lycett (2016) similarly concluded that hands-on ERP activities enhance students' understanding of business processes.

Although research supports hands-on ERP learning in courses focused on ERP and business process management, practical guidance for integrating ERP into an Introduction to MIS course is limited. Time constraints often restrict coverage to one or two class sessions. To address this, our approach embeds experiential learning principles into a concise, modular ERP framework designed for easy adoption.

Experiential Learning Theory (ELT) promotes learning through direct experience followed by reflection. The process includes four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb & Kolb, 2009). As we designed our ERP learning approach (Section 3), we intentionally integrated all four stages of this cycle.

3. HANDS-ON ERP

In our Introduction to MIS course, the students are typically exposed to various IS fundamental topics such as hardware and software, database, and business strategy. The students are then exposed to business process management (BPM) and ERP concepts in a traditional lecture-style environment. Once the topic of ERP was finished for this particular intervention, the normal flow of the course was interrupted, and our hands-on ERP assignment was introduced to the students. The primary purpose of this intervention was to provide students with concrete experiences where experimentation and reflection were encouraged thus enabling a more enriched understanding of ERP concepts.

3.1 The Setting

Our university is a public, medium-sized institution in the mid-Atlantic region of the United States. The Department of Computer Information Systems and Business Analytics (CIS & BSAN) is part of the School of Business. The Introduction to MIS course is required for all undergraduate business students, typically taken in their freshman or sophomore year. Roughly 800–900 students majoring in Accounting, Finance, Marketing, CIS & BSAN, and Management enroll each semester.

Each semester, the course is taught by six to eight instructors. Typically, one to two weeks are allocated to Business Process Management (BPM) and ERP, with ERP limited to one class session due to time and resource constraints. To be feasible for all instructors, the hands-on ERP activity had to be concise and self-contained. The pilot implementation involved three instructors and approximately 250 students.

3.2 Hands-on ERP Assignment

Our hands-on ERP approach uses Odoo (Odoo.com), a commercially available open-source platform. Odoo runs in the cloud and provides core ERP functions such as accounting, inventory, manufacturing, and sales. The Belgium-based company offers its software as a service, designed to be both intuitive for users and flexible enough to support organizations of any size. At the time of this project, Odoo offered a free trial that allowed students to create an ERP instance with front-end applications and an associated database that remained active for eight months. We designed the instructional modules described below to align with this resource.

Figure 1 shows the hands-on ERP learning framework we developed at our university along with approximate completion times for the various activities. As shown in Figure 1, our framework includes five ERP learning modules that we designed to be clear, accessible, and appropriate for students with no prior experience. Appendix A presents the instructional materials we created for each module. We structured the modules so that students could complete them individually outside of class, giving them the chance to work remotely and simulate the type of training they might experience in a business environment.

We delivered the modules through Canvas, the learning management system our university uses. This platform offered a familiar and user-friendly experience for both students and instructors. To support the learning process, we created a full set of educational resources including slide decks, video tutorials, and assignments. These materials guided students through a variety of business scenarios using the free Odoo student trial. This structure allowed students to move through the content at their own pace and follow a learning experience similar to professional technology training.

The eight-month trial allowed students to continue using their ERP instance to reinforce learning beyond the scheduled course activities. We designed the modules around experiential learning theory, incorporating abstract conceptualization, concrete experience, reflective observation, and active experimentation into the activities and assignments.

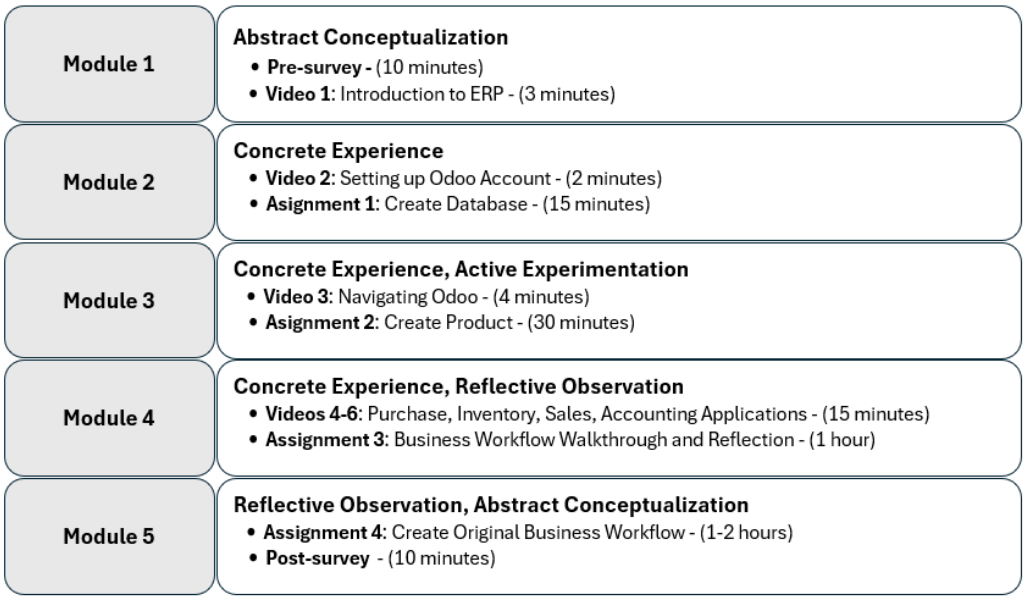

Figure 1. Hands-on ERP Learning Framework

As shown in Figure 1, Module 1 began with a pre-survey (see Appendix B) designed to assess students' prior knowledge and initial perceptions of ERP, based on earlier course material. In accordance with Institutional Review Board (IRB) guidelines for this study, students were informed via a recruitment statement that participation in the surveys was voluntary, anonymous, and had no impact on their course grades. Completion of the surveys was not required to complete the Odoo assignments, which were submitted for course credit. The pre-survey encouraged students to reflect on their previous ERP learning and served as a baseline for evaluating the modules' impact. Additionally, Module 1 included an introductory video (see Video 1 in Appendix A) covering core ERP concepts, reinforcing prior content and enhancing students' conceptual understanding through visual examples.

The second module included a short video (see Video 2 in Appendix A) that guided students through the process of setting up a free educational account and database. The video also explained which Odoo applications to add to their database instance. For this exercise, we used the Purchase, Inventory, Sales, and Accounting process modules in Odoo. However, instructors can adjust the activity by selecting from many other available modules. Module 2 concluded with an assignment where students uploaded a screenshot of their work to confirm success.

The third module included a short video (see Video 3 in Appendix A) that introduced students to the Odoo platform and explained how to navigate its main features. The video included step by step instructions on how to create a product within the Inventory application. After watching the video, students completed an assignment that required them to create a product for their hypothetical business and enter the data into their database. Module 3 gave students their first concrete ERP experience and encouraged them to experiment with the core functions of the Odoo platform.

The fourth module used a series of short videos (see Video 4, Video 5, and Video 6 in Appendix A) to explain how to complete a basic business workflow by simulating the movement of goods through various Odoo applications such as Purchase, Inventory, Sales, and Accounting. Figure 2 shows this common workflow, which the course introduced in earlier lectures. We used this workflow throughout the modules to give students a familiar structure as they worked on their project. Module 4 included an assignment that asked students to follow along in the software and show their understanding. The module ended with a written reflection where students described their challenges and what they learned. This final step encouraged students to connect the abstract ERP concepts from class to their practical experience. The

reflection paper also enabled us to collect feedback on ease of use, perceived usefulness, and overall impressions. We later reviewed and discussed these responses in class to reinforce and clarify the ERP learning outcomes.

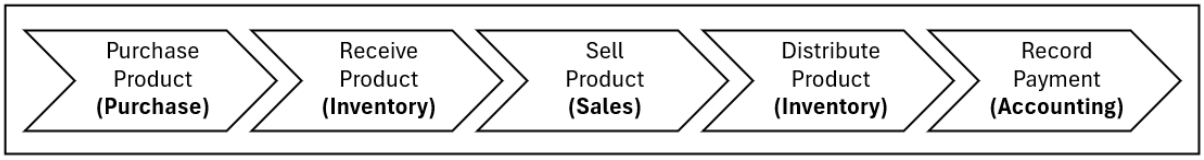

Figure 2. Basic Business Workflow With Corresponding Application in Odoo

The fifth module, shown in Figure 1, allowed students to create and explore a new business scenario independently. They built and populated their own databases with ERP module applications to demonstrate knowledge from earlier modules. For the final assignment, students submitted Odoo reports that captured a business flow of their choice and included a brief description of the hypothetical workflow. At the end of the module, they completed a post-survey that repeated the pre-survey questions to measure learning gains.

4. FEEDBACK, TEACHING SUGGESTIONS, AND FURTHER DISCUSSION

The hands-on ERP framework shown in Figure 1 was implemented in an undergraduate business course primarily taken by freshmen with limited ERP experience. Instructors reported significant improvement in students' understanding and engagement. Classroom discussions became more focused, and students demonstrated stronger ERP vocabulary and comprehension, reflected in higher exam performance.

Student feedback from Module 4 reflections was overwhelmingly positive. Many valued the hands-on approach over traditional lectures:

- "These exercises really helped me fully grasp the concept of ERP. As a hands-on learner, it was much easier to practice with Odoo to reinforce what we learned in class."
- "I have a better understanding of ERP after this project. The experience showed that ERP software isn't as intimidating as it seems—it can actually make business operations easier."
- "Overall, the assignments were easy to follow and fun to complete. They helped me understand ERP and made me excited about how businesses use platforms like Odoo."

Students frequently cited the exercises' clarity, usefulness, and real-world relevance. Based on these reflections, we recommend including a structured reflection assignment like we did in Module 4 to capture students' understanding, perceived ease of use, and perceived usefulness. Open-ended questions were particularly effective in providing insight into students' experiences. After analyzing the feedback, instructors should review findings with students to reinforce learning and foster reflection, consistent with experiential learning theory.

Additionally, analyzing the pre- and post-survey results can help identify specific areas for improvement. Instructors should evaluate what students learned, where knowledge gaps persist, and then refine the modules accordingly. We also recommend including an open-ended post-survey question inviting students to describe any challenges they encountered. Representative comments included the following:

- "I am unsure whether the person who made the videos was using an old version of Odoo, as some things looked different from what I was seeing. I believe it would be helpful if new videos were made on the updated version of Odoo."
- "You should know that Odoo gets updated frequently because a couple of buttons in the video do not appear in the most recent version of Odoo."

Without eliciting candid feedback, improvements are often limited to instructors' ad-hoc observations. We also recommend engaging students in discussions about identified issues or learning gaps. These collaborative conversations promote student ownership, provide additional reflection opportunities, and reveal insights not captured in written surveys.

Finally, we recommend that instructors use hands-on ERP exercises to reinforce the broader concept of information systems. ERP systems offer one of the most comprehensive examples of an information system, encompassing hardware, software, databases, processes, and people. By engaging with these exercises, students not only deepen their understanding of ERP but also develop a more holistic view of what information systems are and how they operate within modern organizations.

5. CONCLUSIONS

Hands-on learning activities greatly enhance student comprehension in courses focused entirely on ERP, but implementing such exercises in introductory MIS courses, where ERP is only one of many topics, can be challenging. Constraints such as limited class time, technical complexity, and software licensing costs have traditionally led many instructors to rely solely on lecture-based methods. Without hands-on opportunities, many students, particularly those in non-MIS majors, may find ERP content dry or disengaging. Cloud-based, intuitive, and free ERP platforms like Odoo offer an effective solution: they enable practical, hands-on learning without the costly and time-intensive setup typically associated with traditional ERP software. In this paper, we demonstrate how instructors can design engaging ERP exercises that increase student participation and understanding, even within the compressed timeframe of an introductory MIS course.

Beyond presenting our hands-on ERP approach, we provide recommendations for faculty seeking to adopt similar strategies. We contend that instructors at other institutions can easily adapt and expand this method using online, cloud-based ERP tools like Odoo. Moreover, this approach not only enhances teaching and learning outcomes but also opens avenues for research on the intersection of experiential learning theory and information systems education.

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APPENDICES

Appendix A. Odoo Modules With Links to Video Demonstrations

Note to Professors: The following five modules provide students with hands-on experience using Odoo, an ERP (Enterprise Resource Planning) software package. Students create a free account, navigate the platform, and enter data based on real-world business workflows such as Purchasing, Sales, Inventory, and Accounting. The goal of this project is to guide students through using a modern ERP system in a structured and accessible way.

Module 1: Introduction to ERP. Module 1 helps you explore Enterprise Resource Planning (ERP) systems. Later modules guide you through hands-on practice with your own ERP database in Odoo, an open-source ERP software package.

Tasks:

1. **COMPLETE** Pre Survey (see Appendix B)
    - Please note, you are not expected to have prior knowledge of ERP or Odoo
2. Watch **Video 1** for a brief introduction to Enterprise Resource Planning

Module 2: Create Your Practice Account and Database. In Module 2, you will gain hands-on experience with Odoo by creating the database you'll use for later modules.

Odoo is an open-source ERP software that helps organizations manage key business processes like inventory, sales, accounting, customer relationship management, and project management. As shown in Figure A1, you can set up a free demo account by creating a database that begins with "edu-".

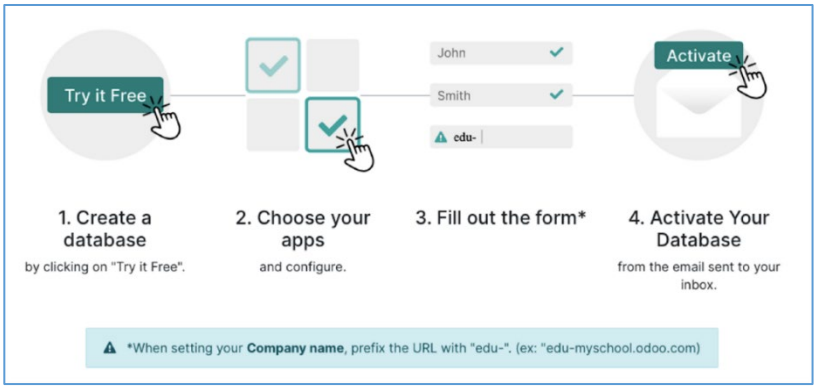


Figure A1. Creating the Odoo Database (Screenshot from Odoo.com website)

Tasks:

1. Watch **Video 2** to learn how to setup an Odoo account
    - **Note:** For Mac users, Odoo does not run properly on the Safari Browser
    - Use a browser like Google Chrome instead
2. To start, add the **Purchase, Inventory, Sales, and Accounting** applications to your database
3. **COMPLETE ASSIGNMENT 1**
    - Once you have created your account, submit a screenshot of your new database
    - The screenshot should contain the apps you have added as well as your name in the top right corner

Module 3: Navigating an ERP. Module 3 introduces you to some basic features of Odoo.

Tasks:

1. Watch **Video 3** and follow along in your database to get comfortable moving around in Odoo
2. Spend some time exploring Odoo
3. **COMPLETE ASSIGNMENT 2**
    - **Background:** You run a small business that sells various kitchen appliances. For example, one of your many products is a microwave
    - Create a new product (Microwave) in Odoo:
        - The sales price for a microwave from our business is $50.00
    - Submit a screenshot of your new product

Module 4: Business Workflow in ERP. In Module 4, you will explore how ERP systems integrate various business functions.

To begin with, visualize a business workflow process in Odoo. Then, imagine you run a small business that sells kitchen appliances. For example, one of your products is a microwave. You will use Odoo to document the workflow for buying and selling these appliances. Before you start in Odoo, take a moment to brainstorm the steps involved in this process using the Purchase, Inventory, Sales, and Accounting applications.

Tasks:

1. Watch **Video 4** to understand the first steps of our business workflow
2. Watch **Video 5** to understand the receiving of products in the Inventory application
3. Watch **Video 6** to determine how to sell our product and record payments
4. **COMPLETE ASSIGNMENT 3**
    - As you follow along with the videos in Module 4, collect the following reports from Odoo and submit them for credit:
        - (Purchasing) Submit your pdf of the purchase order for 10 microwaves
        - (Inventory) Submit your delivery slip to receive 10 microwaves in inventory
        - (Sales) Submit your sales order for the kitchen appliance example
        - (Inventory) Submit your delivery slip of microwaves to your customer
        - (Accounting) Submit your customer invoice for the kitchen appliance example
        - (Accounting) Submit your Profit and Loss Report
    - Reflection Paper Submission:
        - Reflect on your experience in Odoo (challenges, ease of use, key takeaways, etc.).
        - Submit your reflections in writing using the following guidelines:
            - At least 150 words long
            - Professionally structured and written

Module 5: Create Your Own Business Workflow. Module 5 is designed for you to apply what you have learned to your own business workflow example.

Tasks:

1. **COMPLETE ASSIGNMENT 4**
    - Create a similar business workflow process in Odoo, using a different business idea and products
        - You must show the movement of at least two different products through the buying-and-selling workflows outlined in Module 4
    - Submit the following:

- Short description of business, products, and description of workflow
- The six reports you submitted in Module 4 that now pertain to your new business

2. COMPLETE Post Survey (see Appendix B)

Appendix B: Survey Questions

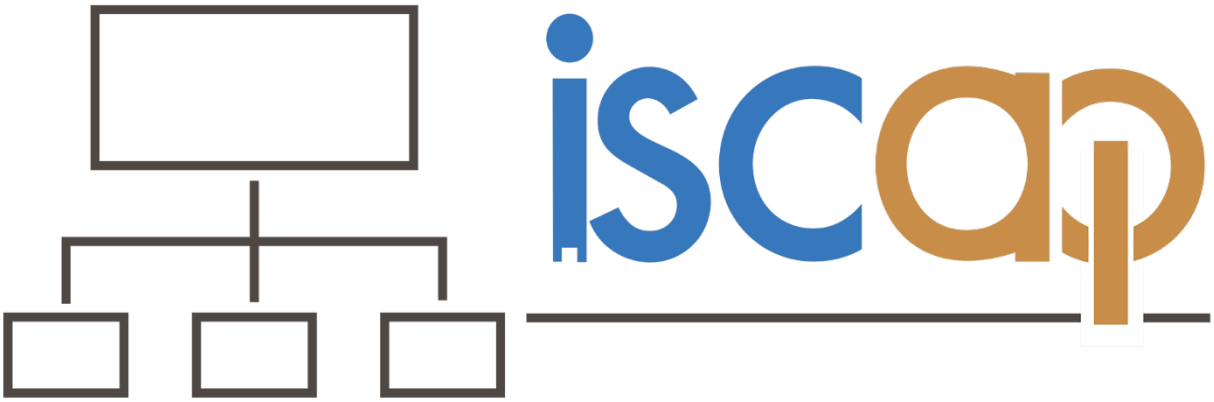
Survey Scale:

- 7 Point Likert - Strongly Disagree, Disagree, Somewhat Disagree, Neither Agree nor Disagree, Somewhat Agree, Agree, Strongly Agree

Survey Statements for Both Pre- and Post-Surveys:

- I have heard about ERP software.
- I am familiar with ERP software.
- I have experience using ERP software.
- I intend to use ERP software in my career.
- ERP platforms are a useful tool in business.
- Learning to use Odoo will be easy for me.
- I am familiar with ERP applications in Business.
- I am comfortable with the idea of learning to use an ERP platform.
- I have used ERP software during an internship or other work opportunity in the past.
- I am interested in learning more about ERP software.
- I can envision how ERP software could be a useful application in my future work positions.
- I feel confident in my ability to navigate an ERP.
- I see myself using ERP platforms in the future.
- I have learned about ERP systems.
- I have a strong understanding of ERP systems.
- It will be easy for me to become skillful in using Odoo.
- I heard about Odoo ERP software prior to this course.

INFORMATION SYSTEMS & COMPUTING ACADEMIC PROFESSIONALS



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