

A STUDY OF THE EFFECTIVENESS OF AN ERP SIMULATION ON STUDENT LEARNING EXPERIENCES IN THE CLASSROOM

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Abstract: *In this paper, results are presented of an investigation into student perceptions of a classroom learning experience using an Enterprise Resource Planning (ERP) Simulation. Students from all majors in a College of Business required core integrated course were surveyed to evaluate their learning experience as it related to multiple functional areas such as: Accounting, Business Integration, Economic Models, Use of the ERP System, Strategy Development, Financial Management, Group Dynamics and Skill Development. This study evaluates the effectiveness of the ERP simulation on enforcing the learning objectives of the course as well as its relationship to the functional areas listed above. Students were also asked to compare their simulation experience to the use of SAP system exercises assigned as course requirements.*

Keywords: Enterprise Resource Planning, Simulation, Business Process Integration, SAP

I. INTRODUCTION

In this paper I will present and discuss feedback gathered from students who participated in an ERP simulation. The simulation was a required component of a mandatory Integrated Business Experience course taken by all majors in the College of Business Administration at Central Michigan University. Specifically, the ERP simulation involves students running a business using SAP software. This paper will present and evaluate survey findings. The paper concludes with a discussion of student perceptions of the simulation, the overall course objectives, the effectiveness of the simulation and a comparison to other learning materials used in the classroom.

The ERP simulation had several rounds which represented a business quarter each round. Student ran one round (or a business quarter) each assigned day providing various levels of pressure to complete tasks in different functional areas of business. Students were assigned roles in pricing, planning, logistics and sales and inventory reporting, manufacturing and procurement. In student groups they completed a series of steps in order to complete tasks necessary for each individual role. Each role's responsibilities and various steps involved therein were outlined on a guide sheet for each student, so their roles were very clear. In addition, before the simulation, students were given instructions through presentation, lecture and video tutorials to train them on the simulation specifics in an effort to provide clear information and make sure each student understood the objectives and activities involved in the simulation. Students were also given access to a learning portal on the ERP simulation website and PowerPoint slides for each business scenario.

II. METHODOLOGY

The methodology used to collect data was a survey given to four sections of students after they completed the ERP simulation in their core business course. The survey consisted of three different sections. The first section gathered demographic information such as class standing, major and minor, and any previous SAP or TERP 10 experience. This information allowed the researchers to further understand and draw conclusions on how effective the ERP simulation actually was, given these students with higher level of experience within SAP and Information Systems and their perceptions compared to others. Students were not required to have an identifier or submit any personal information such as their name or student number, so all responses were kept anonymous.

The second section of the survey, which is what this research is primarily focused on, dealt with the specific teaching/learning effectiveness of the ERP simulation within various content areas. For these three sections, students were asked to provide responses to how the ERP simulation compared to other learning components of the course. A numeric scale from 1 to 5 was provided for student responses, 1 being very effective and 5 being not effective at all. Initially, students were asked to rank the ERP simulation on its ability to teach the overall objective of the different areas within SAP such as Accounting, Business, Economic Models, Use of ERP Systems, Strategy, Financial, Group Dynamics and Skill Development. Second, students were to rank the ERP simulations overall effectiveness in teaching these areas and lastly, students were to rank the ERP simulation as it compared to case exercises completed in the students' classroom for each of these areas. This section was analyzed while cross-referencing student demographic information to further understand the students' perceptions

Publication History

Manuscript Received : 12 March 2015
Manuscript Accepted : 20 April 2015
Revision Received : 25 April 2015
Manuscript Published : 30 April 2015

The final section of the survey allowed the students to answer questions to evaluate the ERP simulation while also providing feedback on how the simulation could be altered or improved. This section also contained questions focused on the student team aspect with the simulation by asking the student to rank their involvement and team interaction throughout the simulation. This research will be analyzed on an associate research paper.

III. SAMPLE AND DATA COLLECTION

The sample for this survey was Central Michigan University College of Business students currently enrolled in an integrated core business course. This course is a requirement for all students pursuing a Bachelor of Science in Business Administration regardless of major. The survey and results of the research will be used for future studies in this as well as other courses in the business core. In total, there were 116 subjects who took the survey and gave both qualitative and quantitative responses on the effectiveness of the ERP simulation and their experiences with it.

The survey was created and sent using GoogleForms. The survey was easily accessible for students and was presented in a way that was easy to understand and process. The survey was shared via a link in the students email sent by their and was also posted as an announcement on the course management system. Students were asked to complete the survey, but not required in any way. The participation rate among the students surveyed was over 90% and provided enough feedback and data for this research. The data was then exported directly from the survey into a Google Spreadsheet within Google Drive and from there was exported as an Excel Spreadsheet to further analyze.

IV. VARIABLES AND MEASUREMENT

The specific analysis focused on three different areas: Learning Objectives, Learning Effectiveness and a Comparison to the Case/Exercises completed in class. For Learning Objectives, students rated the ERP Simulation on the significance of the learning objectives, or how evident they were within the simulation in the areas of: Accounting, Business Integration, Economic Models, Use of ERP System, Strategy Development, Financial Management, Group Dynamics and Skill Development. These were to be ranked using the following scale: 1) Primary Purpose, 2) Purpose, 3) Not Sure, 4) Poor Purpose, 5) Not a Purpose. Next, they were to rate the ERP Simulation on how well it taught the students in those same areas. The scale used for this analysis was: 1) Very Well, 2) Somewhat Well, 3) Mediocre, 4) Somewhat Poor, 5) Very Poorly. The students also compared the ERP Simulation with the SAP Exercises provided based off how well it taught the different areas. The scale used for this was: 1) Simulation Superior, 2) Simulation Somewhat Superior, 3) Class Exercises and Simulation are Equal, 4) Exercises Somewhat Superior, 5) Exercises Superior.

V. DATA ANALYSIS

The results of this data varied depending on the area. The first section that was analyzed was how evident students thought the learning objectives of the simulation were within the actual ERP Simulation. On average, students thought that the ERP simulation achieved its learning objectives in all of the areas. The area they thought it achieved this the most was Business Integration and the area they thought did the least

were the Economic Models. This was then broken down and compared with the responses given by Information Systems Majors, Majors with TERP10 experience/certification, and Information Systems Minors. The majority of these students had experience with other SAP courses as well and could better compare the ERP simulation to normal classroom learning. In all areas, IS Majors had a better perception of how well the ERP simulation achieved its purpose in teaching the learning objectives. Information Systems Majors with TERP10 experience had even better results. Information Systems Minors had better perceptions of the ERP simulation in achieving its goal in teaching learning objectives as well for all areas except for Economic Models, which was only .023 away from the total sample mean.

This shows that overall the ERP simulation did achieve the purpose of teaching the learning objectives to students and student perceptions of this rose if they had other experience with SAP courses or were pursuing further coursework in the Information Systems areas (Table 1).

The second section analyzed involved student perceptions of how effective the ERP simulation was in teaching them the different areas of the ERP System. Overall, the students thought the ERP simulation did somewhat well in teaching the different functional areas. The higher scores (areas that were closer to mediocre) were Accounting and Economic Models. Like the previous questions, IS Majors, Majors with TERP10 and IS Minors had overall better perceptions of the effectiveness of the ERP simulation. In almost all cases, their results were significantly better than those of the total averages. This again reflects that students with more experience and interest in the subject area felt that the ERP simulation was very effective to somewhat effective in how well it taught the learning objectives of the course (Table 2).

The third section analyzed the comparison of how students thought the ERP Simulation compared to the in class cases and scenario exercises. In all areas except for accounting, student perceptions showed that they preferred the ERP Simulation to the in class exercises. These results remained fairly consistent among IS Majors, IS Majors with the TERP10 and IS Minors as well. For all of these, accounting wasn't the superior choice within the simulation, however the students also didn't prefer the in class exercises to teach them the accounting as either (Table 3).

VI. CONCLUSIONS

From the data it is shown that students have a very good perception of the ERP Simulation based upon their learning experience. They believe that the simulation achieved its purpose in teaching the different functional areas that the ERP System focuses on. In addition, students felt the ERP Simulation was superior to the exercises. This shows that based off student perceptions, the ERP Simulation is very effective in the student learning experience teaching the functional business areas within the system. When cross referenced with the demographic information of students who are Information System Majors and Minors and have completed the TERP10 results, for the most part, these perceptions only improve and favor the ERP Simulation. In conclusion, the ERP Simulation was determined to be very effective when teaching the integration of an ERP system whether the topic was new to students or they already had

further teaching and learning within the ERP System and subject area.

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Appendix

Table 1: Evidence of Learning Objectives in the ERP Simulation

	Accounting	Business Integration	Economic Models	Use of ERP Systems	Strategy	Financial	Group Dynamics	Skill Development
Overall Objective	2.517	1.922	2.733	1.940	2.094	2.276	2.000	2.198
IS Major	2.333	1.333	2.167	1.500	1.750	1.833	1.750	1.583
IS Major w/ TERP10	1.500	1.500	2.500	1.000	1.500	1.500	1.000	1.500
IS Minor	2.125	1.375	2.750	1.500	1.750	2.250	1.750	2.000

Table 2: Students' Perception of Simulation Relevance in Teaching Areas of the ERP System

	Accounting	Business Integration	Economic Models	Use of ERP Systems	Strategy	Financial	Group Dynamics	Skill Development
Overall Effectiveness	2.853	2.026	2.741	2.052	2.121	2.344	2.051	2.190
IS Major	2.583	1.750	2.250	1.500	1.667	2.000	1.583	1.667
IS Major w/ TERP	2.500	1.000	2.000	1.000	1.000	1.500	1.000	1.500
IS Minor	2.500	1.500	2.875	1.625	1.625	2.500	1.875	1.875

Table 3: Comparison of ERP Simulation to Case and Scenario Exercises

	Accounting	Business Integration	Economic Models	Use of ERP Systems	Strategy	Financial	Group Dynamics	Skill Development
Compared to Case	3.052	2.198	2.552	2.302	2.103	2.560	1.983	2.526
IS Major	3.167	2.083	2.333	1.667	1.750	2.667	1.75	1.833
IS Major w/ TERP	3.500	2.500	2.000	1.500	1.500	2.500	1.000	2.500
IS Minor	2.875	1.875	2.500	2.125	2.000	2.625	2.250	2.375

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