

Operations Management Through Study Abroad: Approach, Evaluation, and Insights for Application

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Abstract. This paper focuses on the development of a novel approach to teaching operations management (OM) topics through experiential learning with a study abroad course going to France, Germany, and Spain, in which students engaged in company visits and other learning activities. Content analysis of self-reflection included in final reports indicated that students incorporated concept applications from multiple areas of OM in their reports. Assessment of student evaluations indicated that, in comparison with students taking the same course in a traditional on-campus format, students believed that they learned significantly more from this course as compared to other courses on the focal campus. The program responds to critiques posed by authors who suggest the superficiality of some study abroad programs and incorporates novel approaches to engage student appreciation of the implications and context of OM topics. Activities for engaging similar exposure to topics in the traditional on-campus OM classroom are presented.

Keywords: operations management, study abroad, experiential learning.

1. Introduction

Experiential and active learning processes have increased in their adoption by colleges of business as they seek to develop individuals capable of functioning effectively in globally competitive business settings. Harsell and O’Neill (2010) have defined experiential learning as the process of “learning by doing”. Experiential learning has been applied through such educational approaches as internships (cf. Dillon, McCaskey, & Blazer 2011), consulting projects (Maskulka, Stout, & Massad 2011), student-run businesses (Tompkins & Schlesinger 2010), and short-term faculty led study abroad programming (Tuleja 2008, Loro 2009). The commonly accepted advantage of experiential learning processes is that students, by means of being actively involved in the context of the business concepts under study (whether the workplace in an internship, the company setting for a consulting project, the actual shop floor, or the running of a firm whether virtually through simulation or actually through student-run firms) will more fully appreciate not only the

key concepts being considered, but also the fit of these concepts with others that they are learning. The benefits of this learning is clear in that it delivers on stakeholder-valued competencies such as analytical thinking, people and task management, and self-management (Maskulka *et al.* 2011). Furthermore, AACSB International recognizes both the need for student engagement in the learning process as well as the need for diversity and global awareness as a part of the business curriculum of accredited institutions (AACSB International 2012). Experiential learning in the global environment is also helpful in raising awareness of business practices, intercultural management differences, and institutional environments within which business practices occur.

Such experiential learning practice requires in-depth and focused seminars on campus, field experiences in the local or regional community, or the participation in study or travel abroad programs. According to Open Doors (Institute for International Education 2013), the number of U.S. students studying abroad increased 3.4% in 2011-2012 to reach 283,322 students. In 2011/12, according to Open Doors, 1.4% of all US university students studied abroad, of which 58.9% studied abroad for short-term programs of 8 weeks or less in duration (Institute for International Education 2013). The goal of internationalization is present in many universities' stated plans, though separating the rhetoric of its benefits from its real outcomes is sometimes challenging (Forsey, Broomhall, & Davis 2012).

There are many specific benefits associated with study abroad program participation, such as enhanced personal skills, sustained greater interest in further study, and intercultural competence and employability (Nunan 2006). Sutton and Rubin (2004) found that in matched samples of students who had studied abroad versus those who had not, the following differences researchers attributed to study abroad: higher functional knowledge, greater knowledge of global interdependence, greater knowledge of cultural relativism, greater knowledge of world geography, and greater cultural sensitivity. Yet Sutton and Rubin (2004) find no significant differences between study abroad participants and their peers on interpersonal accommodation and verbal acumen. However, Feinberg (2002) noted that U.S. students tend to be able to learn about themselves on study abroad programs, but doubted that they learned much about other areas. Van de Berg (2007) noted the criticality of intervening at pre-departure, intra-experience, and post-return to generate optimal learning benefits for students on study abroad programs.

One area in which experiential learning activities appear to have been limited is that of Operations Management (OM). Polito, Kros, and Watson (2004) tested OM concept recognition via the use of the Zarco manufacturing experiential learning activity. Fish (2008) reported on graduate students' application of OM processes to their employers. Bardati (2006) reported on the use of the campus environmental audit as an operations planning tool. Only Simpson and Hancock (2011) had explicitly utilized experiential learning

and digital technologies to connect students between countries to co-teach OM topics. The current program extends the knowledge base about the opportunities to apply OM course principles in a study abroad experiential learning setting, and also identifies some teaching applications to incorporate some of those experiential applications gleaned through the study abroad experience to enhance the traditional classroom setting.

2. Experiential Learning in an OM Course Through Study Abroad

The present program developed as an extension of an existing study abroad program called Business in Europe that had been in existence for 11 years at a medium-sized AACSB accredited college of business in the Southeastern United States. The purpose of that study abroad program was to expose students to the economic, socio-cultural, and political-legal environments of the countries of France, Germany, and Spain with an emphasis on how business practices differ from those used by companies in the United States. The addition of the OM course to Business in Europe study abroad program in May 2012 was targeted for several reasons: (1) it was a required course for graduation for all Bachelor of Science in Business Administration majors, thus creating a large potential market; (2) it fit well with the range of activities generally conceptualized on the program; and (3) it had been tested in a study abroad program in a new study abroad program in a previous year and found to have tremendous opportunities for application, study, observation, and dialogue about OM issues. Student response to this course has been very positive, and the OM program has been offered again in 2013 and 2014 and is planned for 2015. It has become a core offering of the May study abroad program with student interest coming long before recruitment formally opens for the program.

In addition, it is clear that aspects and key concepts of OM are present in many ways within the development and management of a study abroad program because attributes of project management are applied to the program from its basic conceptualization. Each study abroad program is essentially a new project, each with its own start and target finish dates, scope in terms of travel areas, time at each destination or step and size of class. Even if the trip has been completed in a past school session, the dates, airline, environment, housing options are different, and student groups are different. Process issues are applied in the order and time allowed at each country destination, business or event to visit. Scheduling issues are addressed in mode of transportation and its availability (publicly scheduled transport), capacity of chosen transport and business operating hours. Queuing issues arise in moving a group through airports, train stations, and sports events, as well as in the actual encounters that the group has in each business it encounters. Questions about optimization

come into play as the group organizers consider whether to keep the group together utilizing a single queue, single server, single channel-multiple server, or multiple queues with single servers. Constraint applications are encountered in several of the previously mentioned operational topics. How well these are applied can directly influence the quality, safety, satisfaction, and cost of each program. Thus, there was a rich environment from which to draw field observations, insights, and comparisons regarding effectiveness in the experience of the study trip as well.

Consideration was given to creating a similarly rigorous and concept-based exposure to the key concepts in OM that the students would have received in a traditional on-campus delivery of the course. As such, three steps were followed. First, an evaluation was done of the key concepts in OM covered by three leading undergraduate textbooks in the field (see Table 1). This list provided a background from which value adding exposure activities were sought out and the range of issues that needed attention in the pre-departure theoretical introduction part of the course, and what needed to be placed in an online accessible Blackboard format for students to retrieve to incorporate along the field study experience. As topic areas in the focal college of business' programs such as linear programming, statistical process control, forecasting, and human resources are each covered in depth in other courses, they each represented a very minor focus of the present course, in both traditional on-campus and study abroad format.

Table 1: Content Areas Noted Within Leading OM Textbooks

Content Addressed	Operations Management: Creating Value Along the Supply Chain, 6th Ed., Russell & Bernard, Wiley	Operations Management, 11th Ed., Stevenson, McGraw-Hill	Operations Management, 10th Ed., Heizer & Render, Prentice Hall
Introduction to Operations <i>Overview the role of operations management</i>	X	X	X
Quality Management <i>Overview of the quality movement, history, and key individuals involved</i>	X	X	X
Statistical Control <i>Presentation and explanation of developing statistical process control charts for monitoring performance</i>	X		X
Product Design <i>Types of product design; process or product, characteristics and advantages of each</i>	X	X	X
Service Design <i>Characteristics and issues of service operations</i>	X	X	X
Process Planning <i>Types of processes, advantages and disadvantages, measuring & monitoring</i>	X	X	X
Capacity & Facilities <i>Discussion of capacity as a strategy, and coverage of layout decisions</i>	X	X	X
Human Resources <i>Acquiring, motivating and managing employees</i>	X		X
Project Management <i>The role of projects in meeting corporate strategy</i>	X	X	X
Supply Chain <i>The design and improvement of supply chains and tools for monitoring</i>	X	X	X
Global Sourcing <i>The role of procurement, outsourcing and distribution</i>	X		
Forecasting <i>The role of forecasting in supply chain management</i>	X	X	X
Inventory Control <i>Elements of and types of inventory systems</i>	X	X	X
Sales & Operations Planning <i>Strategies for demand and capacity decision.</i>	X	X	X
Resources Planning <i>Discussion of MRP/ERP issues, dependent & independent planning</i>	X	X	X
Lean Systems <i>Elements of lean production, pull vs. push, waste reduction</i>	X	X	X
Scheduling <i>Types of scheduling, objectives of and sequencing</i>	X	X	X
Linear Program <i>Review of mathematical models for optimization strategy in decision making</i>	X	X	
Maintenance & Reliability <i>Ensuring assets continue to perform as required</i>			X

Second, company field visits were then sought out that could enable active engagement (tour of the plant, participation in discussion about initiatives, engaged problem solving, exposure to various layouts) by the students in the course and provide exposure to one or more of the OM issues areas covered in Table 1, incorporate some of our partner institutions' students in cooperative engagement, and represent a balance of visits across different country environments. We sought a wide range of operational environments: focus on customer versus business customer bases (McDonalds and Auchan versus Banco de Santander and Siegwirk), service versus manufacturing layouts (McDonalds, Auchan, and Lindt's Imhoff Chocolate Museum as examples), and labor versus capital intensity (McDonalds versus Juwi as examples). We also sought to help students identify and compare operations issues in organizations that focused on different types of profit and funding bases (non-profit international organizations such as UN World Tourism Organization and Deutsche Welle as well as for-profit organizations like Banco de Santander and Publicis and semi-public firms such as Juwi and Santiago Bernabeu). While we originally had intended to include on the program a visit to the advanced production line of an international automotive manufacturer, that visit was not possible to realize in the time frame of the program as we found out late in the planning process. This lack of a major heavy industrial environment was a limitation to the program that was addressed in the following year, when the group toured TRW as an example of a large scale automated manufacturing facility with MRP/lean concepts. Further detail about the companies included in the visits in the 2012 program, the basis for their inclusion in the program, and the learning objectives and focal OM issues identified for students to target on each visit are noted in Table 2.

Table 2: Background on Field Experiences in Study Abroad Program & Focal OM Learning

Companies	Industry/Description	Focal OM Learning Points
Publicis (Paris, France) 10,000+ employees	Global Advertising/Marketing Agency with operations in over 100 countries (Labor Intensive)	Process by which advertising programs are created for global companies.
Auchan (Paris, France) 250,000+ employees	Hypermarket retailer of electronics, food goods, & specialty items (Labor Intensive)	Layout and product scheduling for large retailer to enable comparisons with student's experience with large retailers in the United States.
Fachhochschule Mainz (Mainz, Germany)	Group activity with multiple cultures represented tasked to build the International University of the future (Labor Intensive)	Evaluate decision making approaches and group-facilitation processes of a multi-cultural team with a specific task outcome; Participate in production-outcome activity in which coordination in short time period was required across a multicultural and multilingual team.
Juwi (Wörrstadt, Germany) 1,000 employees	Renewable Energy Company (Capital Intensive)	Understand the criticality of diverse stakeholders to the engagement of OM tasks in a heavily government controlled company ; Compare layout and design choices for human work models of a company noted throughout Europe for its employee satisfaction; Observe the production model for the production, management, and maintenance of wind energy projects.
Deutsche Welle (Bonn, Germany) 1,500 + employees	German news public broadcaster that broadcasts the news in over 30 languages (Labor Intensive)	Identify the process by which scheduling, development, and quality control across multiple locations and in multiple languages is completed; Observe the production model from start of concept to on-air production.
Lindt Imhoff Chocolate Factory Museum (Cologne, Germany) 7,000+ employees	Tourist attraction that shows the production of chocolate at all different stages with over 650,000 visitors a year (Capital Intensive)	Observe both the production process for creating chocolate and the layout and design of the customer experience in the Chocolate Factory Museum.
Banco de Santander (Madrid, Spain) 185,000+ employees	Started in Spain this is now one of the largest banks in the world (Capital Intensive)	Understand the use of technology to support financial management systems; Compare perspectives of employee systems development as it relates to productivity and satisfaction; Evaluate visitor experience in layout & design of high tech visitors' center.
United Nations World Tourism Organization (Madrid, Spain) Unknown employee count	Agency responsible for promoting responsible, sustainable and universally accessible tourism for its 150 member countries (Labor Intensive)	Understand the role of coordinating bodies in managing ongoing activities human development activities associated with tourism.
Santiago Bernabeu (Madrid, Spain) Unknown employee count	Toured the Santiago Bernabeu stadium from both back and front of the house and engaged with President of the company on OM planning issues related to service delivery for team and fan benefit (Labor Intensive)	Identify process flow issues back of the house (team, security, and facilities) versus front of the house (fan) service components in a professional soccer setting. Additional OM issues include activities from parking lot management, vendor selection, supply chain (concession stocking) post game clean up, or maintenance of the soccer pitch.
McDonalds (Aachen, Germany; Liege, Belgium, Maastricht, Netherlands; Conway, SC)	Visited McDonalds in four countries to compare product, layout and design issues, taste, packaging, and other items (Labor Intensive)	Explore differences by country of key focal areas of branding, use of technology, layout and store design, packaging, promotional offers, pricing, customer service, speed of service, cleanliness, bathroom and parking provisions.

Third, student assignments were brought together to develop both immediate application of the respective target company visit focus to theoretical OM concepts, and longer term retention, comparison and learning were targeted by the development of an inclusive final report focused on targeted OM activities. Development of the student assignments and preparation was based on a strong appreciation of Kolb's (1984) four learning abilities deemed critical to experiential learning: (1) concrete experience to process the stimuli through cognitive memory; (2) reflective observation to recover and consider their memories; (3) abstract conceptualization to apply theoretical principles and concepts to the observed and experienced stimuli; and (4) active experimentation to come to new understandings and problem solving. More specifically, OM focal areas were explained and exposed in a pre-departure, weeklong intensive classroom setting, highlighting key points of required observation and analytical entry points for students to apply in the upcoming study abroad program. Expectations for reflection and ties to theory and process issues were pointed out. Introduction to cultural conditions, historical evolution, and social issues within each study abroad location were given to help students identify potential operations management adaptations based on cultural differences. Elaboration of the appropriate pre-departure preparation and reflection was required to provide a baseline experience of theoretical and conceptual learning for students to identify OM issues along the way and to emphasize the criticality of engaged observation on these points. Student assignments were crafted to require double loop journaling to capture what Kolb (1984) noted as reflective observation and abstract conceptualization.

Each student was asked to focus on OM issues that they observed each day of the program and to respond to those issues through focused journaling incidents, with specific guidance given for insights and comparisons at different junctures both underway and in connection with specific company visits. Jacobson (1963: p. 124) notes the benefits of such activities and experiences, when he stated, "En route the traveler... may have experiences that are more crucial to adjustment than most of the sojourn experiences themselves." Given the participant's involvement as an input into each of the parts of the travel study experience, it is critical to capture the participant's experience with the encounters as they occur and how the participant responds to those encounters and experiences. Journaling has long been used to retain critical knowledge points and connect theory to practice (Dyment & O'Connell 2010) and to protect key transformational learning moments from their incorporation into, and subsequent inability to separate from, the new evolving understanding of the operations management issue by the student (Spradley 1980). Stanitski and Fuellhart (2003: p. 210) noted, "The journal trains students to observe their surroundings and results in a written record of these observations and travels, which helps them more easily remember the

details of the localities, physical features, flora and fauna, statistics, and people encountered.”

In daily program journaling, students were asked to focus on specific OM concepts revealed in the respective visit, to break down the process, to consider the potential explanations (cultural, institutional), and to identify effective and/or ineffective elements of those issues. The lead professor for the course collected, reviewed, commented, and graded each reflection assignment and returned them to the student during the course of the trip. Each student was also responsible for developing a research paper that integrated his or her learning on OM throughout the experience and incorporated the learning and engagement from his or her comprehensive journaling. This emphasis and process reinforced the seriousness and depth with which students completed the daily journaling assignments and the resulting final report, addressing the concerns about the potential for superficiality posed by Dymant and O’Connell (2010). The course grade was dependent on the journaling. Journals were collected every three or four days and reviewed for observations of operational content encountered and for the quality or depth of the observation and how well it linked to the pre-departure and on-line content. Comments were provided and the journals returned to the student. The journal grades, student conduct, and the final paper comprised the final course grade. Thus, the experience allowed for the comparison of OM issues previously discussed prior to departure, such as layout, process design, lean systems, queuing theory, and others across multiple cultural and institutional concepts. This benefit was not one that was available in their regular in-class experience on campus that had focused on a more traditional presentation of the topics, but supplemented the internalization of the concepts.

Fourth, in addition to the focal field trips, each of which had specific learning goals, students were challenged on a daily basis to include in their reflection their experiences, frustrations, and observations about the way in which OM topics were appearing in their study abroad program as a whole. They were encouraged to see and think about how they were experiencing numerous operations activities in the act of getting to and from these meetings (e.g., public transportation and cafeteria settings in different countries), as well as in daily living during the program (e.g., restaurants, hotels, retail encounters, etc.). These observations related to issues such as the group’s progress together to get to a meeting, differences in the ways in which train stations and airports managed specific issues, and processes utilized by the companies visited or services provided. Comparisons by the students spontaneously were drawn between the train operations in Paris (France) versus Bonn (Germany) or the airport layout in Paris versus the Madrid (Spain) layout. A frequently cited observation was the inventory movement and warehouse layout between WalMart in the U.S. and Auchan in Paris where floor space is limited causing storage layouts to be vertical. These observations

led faculty members to identify a number of teachable moments that came from the experience of leading the OM course in a study abroad program.

3. Analyses and Methods

After an intensive weeklong review of key OM concepts prior to departure, the twelve students (10 from the U.S.A. and 2 from China) left on an 18-day study program in France, Germany, and Spain, accompanied by professors of OM, cross-cultural management, and marketing. As a course in international business was also being offered on the travel study program in addition to the OM course and students could choose to take one or both of these courses. Active integration was developed between these learning areas through advanced predeparture discussions, experiential team projects that included cross-cultural teams (often from at least two universities), and including elements of the international business (especially marketing and cross-cultural management) to the framing of OM issues. In addition, for the OM course, as opportunities presented themselves to highlight between-country differences, short discussions were conducted on train platforms, on subways, or at the conclusion of company visits to note the operational difference as a result of country cultures or government requirements.

As noted earlier, all students in the OM course completed ongoing daily journals reflecting the OM issues they encountered and their response to that issue, and/or relation to other topics. These were turned into the faculty members for review and comment and returned for further entries. As noted earlier, journals were collected several times during the trip and reviewed for observations of operational content encountered and for the quality or depth of the observation and how well it linked to the pre-departure and on-line content. Initially, comments were limited in scope and content. With each iteration of review and instructor comments, the detail and reflection of the observance improved for the majority of students. At the conclusion of the program, these journals also served as important reminders for the students about the process of thinking that they had experienced, and inputs into their final reflection paper which integrated these insights. Insights derived from the double loop journals included those related to applying queuing theory, service levels, service quality, packaging, recycling and sustainability, production leveling, process and product layout differences.

As the focus was on identifying how well they would apply the OM topics, we approached the assessment of learning from two different perspectives: (1) retention and active presentation in the final summary report of the OM topic areas generally covered in a semester-long traditional classroom experience (based on Table 1); and (2) overall evaluation of the course for its learning

outcomes in comparison with previous in-class sections of the same class and through program-level assessments.

Evaluation of learning for the first assessment area was accomplished through a content analysis of the final reports for each student. Content analysis was used to code responses indicating inclusion of the topics identified in the textbook review shown in Table 1, with 19 topic categories identified. The instructor for the OM course coded each of the final reports with a 0 (no coverage or application), 1 (minimum to some coverage or application), or 2 (extensive coverage and application). Content analysis has been noted as an effective method to delineate categories, either *a priori* established or gleaned from the materials themselves, in a manner that enables more quantifiable comparison between documents or other media (Silverman 1993, Weber 1990). Initial coding was verified through a second coder, who also coded all documents. When we evaluated the inter-rater reliability between the coders using all three categories, the match rate was 64%, with Cohen's kappa: the corrected for chance match rate was 43.3% on 228 unique rating elements. As the second rater was not an OM professor, we explored whether collapsing the categories of inclusion to binary (1 if mentioned or 0 if not mentioned), thereby combining the originally coded items 1 and 2 to form a single category, we found that the raw match rate went to 75% (on 228 unique rating elements), with the match rate corrected for chance (Cohen's kappa = 49.2%). Generally, rates above 40% are considered moderate in their match levels (Cohen 1960). Therefore, as the rates were both above 40%, we continued to use the ratings of the OM professor as the more expert reviewer, and report those scores below.

Evaluation of learning for the second assessment marker, overall evaluation of the course for its learning outcomes in comparison with previous traditional on-campus offering of the class, was accomplished through conducting t-tests on the raw scores of student evaluations of the course conducted at the conclusion of each course. These evaluations were administered without the instructor present in paper form at the conclusion of the semester for each course taught at the university so students participating on the study travel program had the same evaluation instrument used as those in the traditional settings and were familiar with the instrument. The scores on three of the items asked in the instrument were focused on for this assessment: "I learned more in this class than in other classes I have taken at the university"; "I learned more in this class than in other classes I have taken in the business school"; and "The professor supplemented the textbook with information that improved my understanding of the course material." T-tests were conducted on the responses to these questions for a traditional on-campus section of the class taught one spring earlier by the same professor as compared to the Maymester study abroad section of the class. Comparisons were not available from the spring semester directly preceding the study abroad course

offering as the same professor had other teaching assignments that semester. We believed that this was a valid comparison as it was the semester before any OM courses abroad had been taught by our university, and therefore no cross-contamination by having already taught the abroad course were present.

4. Results

To evaluate the first learning assessment, general thematic areas were identified in the coding process to evaluate coverage of the content areas in the final reports submitted by the students. As noted above, the primary coder recorded marks for each of the 19 OM topic areas for each student. Table 3 below provides a summary, by OM topic area, of the percent of students noting and making specific application to the respective topic area in their final report. With inter-rater reliability acceptable at moderate levels as noted in the section above, the results provided interesting insights.

Evaluation of the content analyses reflected strong coverage and application across some of the OM content areas, and weak or absent application of others in the evaluation of the final reports. As shown in Table 3, 92% of students made specific reference to and evaluation of service design issues, 83% made specific reference to and evaluation of capacity and facility issues and supply chain issues, 75% recognized and evaluated specific issues related to the role of operations management, product design, and inventory control. At the same time, there was no specific application of statistical control charts, maintenance and reliability, project management or linear programming in the final reports by the students. Clearly had more heavy manufacturing industry conditions been included in the site visits, we believe that stronger outcomes would have been recognized (and reported) by the students.¹ These outcomes are understandable given the focus in this course on the topics that were emphasized in the pre-departure orientation and support materials for the course. As noted above, limited emphasis was provided in this class such topics as linear programming, human resources, and forecasting as they are more heavily covered in separate courses in this program. However, resource planning and project management were topics covered in greater depth in this course, and so it was surprising that there were not more expansive and specific incorporation of these themes in project reports, especially as one author remembers equating the study trip as a project to the students before and during the study trip. Possibly the instruction for preparing the summary paper was not clear enough, the students were trying to work within limited space constraints, or their internalization of the topics was already a part of their perceiving the topic in a broader and more holistic way,

1. The authors are grateful to an anonymous reviewer for this observation.

as noted by Spradley (1980), and it therefore did not occur to the students to specifically note the value of that learning insight as other more profound insights had already been based on that internalized foundation. In any case, implications for adjusting the assignment and some of the preparatory elements of the course were made clear and are presented in the Discussion section below.

Table 3: Student Observation by OM Content Area in Final Report (n = 12)

	Concept Area	Percent of Students Mentioning or Applying in their Final Report
1	Introduction to Operations	75%
2	Quality Management	50%
3	Statistical Control	0% *
4	Product Design	75%
5	Service Design	92%
6	Process Planning	67%
7	Capacity & Facilities	83%
8	Human Resources	16%
9	Project Management	0%
10	Supply Chain	83%
11	Global sourcing	25%
12	Forecasting	8% *
13	Inventory Control	75%
14	Sales & Operations Planning	50%
15	Resource Planning (MRP/ERP)	8%
16	Lean Systems	16%
17	Scheduling	42%
18	Linear Program	0% *
19	Maintenance & Reliability	0%

*Traditional OM topic areas identified in Table 1, but not emphasized in on-campus or study abroad versions of the course at this university.

Students clearly recognized the applications associated with queuing issues. As one noted “queuing was a process experienced throughout our entire trip”. Applications of single queues single server and single-queue multiple server were noted. About one-half of the students commented on groups using a different entrance to enter a museum in Madrid where patrons in smaller groups or singles used a separate entrance and discussed the queuing issues involved. A frequent reflection was associated with mass transit environments, notably the rail trains and subway systems. The multiple locations to enter the subway locations with multiple turnstiles were recognized for speeding the

process of entering and exiting the subway location. The impact on process flow through the turnstiles was noted as several students got their large suitcases lodged within the turnstiles. Several students noted that having people queue in mass to board the subway produced a bottleneck as those boarding the train interfered with the effort of those on the train to exit. Having the train doors controlled by timers assisted the trains in maintaining their respective schedules (noted by several students noted as process control), but resulted in both groups trying to load and unload to the detriment of each, especially during rush hours. Students queuing comments included “queuing is necessary to lower costs such as capacity cost and waiting cost”. At a company visit one student commented on queuing distractions “we waited in their lobby for approximately 10 minutes and during that time most of us were forced to stand...” At the Charlotte airport immigration, a student observed “they had at least seven stations that could have been utilized, but only three were open”.

Service levels and service quality were closely associated with the queuing observations. Those observations related these issues to the public transportation system, dining processes, and product availability in a large hyperstore (grocery and department store). Several students noted the difference in service level between the three countries visited as a reflection on national expectations and standards. One student also included comments from a discussion with other class members from China in which they were comparing how the level of service in the European country being visited would not be acceptable in their home country. Service levels reflected as product availability were discussed by most of the class in regards to the hyperstore. Most referred to the need to control inventory levels as the store was located in metropolitan Paris and storage space was limited to receiving and temporary storage. Most recognized and referred to the supply chain issues of demand anticipation, ordering, transportation for this company with limited warehouse space. One student associated train travel with inventory and reflected on the inventory issue of seats being assigned for long destination trips and not for local subway transport. At a buffet dinner when a popular item was finished “customers begin to pile up one after another because a product is not available” that blocked the line for those entering the queue.

The use of McDonald’s packaging made from recycled paper material was noted by and contrasted to the standard use of Styrofoam containers in the U.S. as a sustainability issue. Companies in certain industries routinely use deposits or core fees to encourage part returns both for recycling and production leveling. One student noted a process in Bonn, Germany, in which a person paid two Euros for his first drink and received a token. All subsequent drinks were one Euro. With the last drink, the Euro deposit was returned if the token was presented or if the patron retained the mug and token as a souvenir, that cost was already built into the price. Such applications served to internalize

the operations concepts and related them to issues of pricing, marketing, and the need for customer education for those unfamiliar with such processes.

Process and product layouts and differences were noted. The Lindt's chocolate factory was the product layout company cited by most students. The group toured the process from the roasting of the cocoa beans, to the end product, including mixing, proofing, molding, testing, and wrapping the chocolates. The most frequently cited and contrasted process layout was the school dining facilities that we visited. Students cited the grouping of similar selections in the dining facility, entries, vegetables, and drinks grouped together. Several commented on the layout of these sections and the backward or cross-travel patterns by people who forget to get an item as they passed that station. As one student noted "we were the process". Anecdotally, the student group would be walking down the street talking about bottlenecks, process flow issues, and queuing theory as a normal course of discussion.

Insights from the final reflection essays reiterated the internalization of the topics to the students' mental models across different settings and different functional areas. Several students concluded their final reflection paper with comments such as: "More importantly we were turned into observing it as consumers...you start to notice how the operational decision affect the decisions of the consumer," and "I become more enlightened to the importance of well-constructed process design, service quality, and good decision making in operations management." Such observations reiterated the students' growing awareness of the relationship between OM issues and customer satisfaction. Others' reflection on the process focused on enhancing subject understanding: "this trip opened my eyes into the real production and process layout world...I have a better understanding of this subject ...one that I would not have learned through a textbook," and "[I was] able to understand the management process where a company converts inputs into outputs." Such observations reflect a more holistic appreciation of the OM topics as a set of decision choices that collectively have important ramifications for company outcomes.

The evaluation of student learning compared with on-campus traditional classroom learning were interesting to note, and highlighted overall greater perceived learning from the course abroad. T-tests were performed on the answers to student responses to three of the questions posed in the standardized student evaluations used for all courses. The results of the t-tests (assuming unequal variances) for each of the questions are presented below.

On comparing student response to the measure, "The professor supplemented the textbook with information that improved my understanding of course material," results indicate no significant difference between the mean response for the on-campus traditional OM course ($n = 32$) of 3.75, and the mean response for study abroad OM course ($n = 12$) of 3.92 ($t = .44$; $p = .33$). This result may be better understood in light of the fact that for the study

abroad program a non-traditional “text” was being used by means of pre-departure lectures, handouts, and on-line reading assignments and not a traditional textbook. As such, it is unclear whether students believed that the materials provided by the professor were adequate to their understanding of the course materials in both formats or whether another explanation is more plausible.

Student overall learning in the course was supported, however, as being qualitatively better in the study abroad version of the course according to the remaining two evaluation questions. On the question, “I learned more in this class than in other classes taken at this university,” results indicate that students in the study abroad OM course ($n = 12$) reported a statistically significant higher learning (mean = 3.92) over the on-campus traditional version of the class ($n = 32$) in Spring 2011 (mean = 3.32) ($t = 1.93$; $p = .036$). Furthermore, on the question, “I learned more in this class than in other classes taken in the College of Business,” results indicate that students in the study abroad OM course ($n = 12$) reported a statistically significant higher learning (mean = 4.17) over the on-campus traditional version of the class ($n = 32$) taught by the same professor (mean = 3.34) ($t = -2.83$; $p = .006$). These results validate the findings of Jacobson (1963), who noted that the benefit of such experiential learning can far outweigh the focal areas of the more narrowly defined disciplinary focus itself, but may also reflect some of the insights derived by Feinberg (2002) that denote learning about oneself to be a big component of the study abroad experience as well. However, the lack of significance between the findings on supplementary material between the two course formats indicates at least some refutation for the notion that study abroad programs are not providing the support for learning that their students need.

Finally, student evaluations of the program quality of the study abroad program indicated strong approval of the program, with all 12 agreeing or strongly agreeing that they felt the pre-departure orientations prepared them adequately for the program (10 strongly agreed/2 agreed). All 12 agreed (1) or strongly agreed (11) that they would recommend the program to others, and that the quality of the programming abroad was excellent.

Thus, the current study results indicate support for the ability of students to recall and apply specific theoretical constructs presented in an OM course in the study abroad program setting, in direct contradiction to Feinberg (2002), while the student evaluation results point out that students’ self-reported learning, in comparison with their on-campus colleagues taking the same course from the same professor, was significantly higher. One of the implications of these findings was the to seek an answer to the question: How can we embed the on-campus course with learning insights and perspectives that were possible from the study abroad course to get the benefit of the mini-experience into a more traditional on-campus OM classroom? To identify how

to best proceed, we first reviewed some key moments during the course of the study program that resonated both with student participants as key moments of OM content application and with faculty as transferable to other settings. Some of these examples were recounted as examples or applications noted in the final reports. These insights, summarized in Table 4, allowed the program instructors to better visualize how to bring OM topic areas more experientially into a traditional classroom.

Table 4: Ten Experiential Applications of OM to Study Abroad

Title	Teaching Emphasis	Focal OM Areas
1. It's Not Over Until The Big Bus Leaves	The process of getting a group from point A to point B enables us to evaluate the effects of multiple entry and exit points, push versus pull systems, and queuing.	Queuing, Service Design, Supply Chain, Lean Systems
2. Where's the line?	Queuing systems design differs by the country environment, layout constraints, and institutional expectations.	Queuing, Service Design, Scheduling, Supply Chain, Product Management
3. Hey, they have Fords here.	The development of global supply chains, including sourcing and product design/brand management are affected by the international environment.	Supply Chain, Product Design, Quality Management
4. What letter is my seat on the train?	The elaboration of co-location systems for international trains allows for the development of understandings of key product design issues (train inventory and scheduling) as well as their explanation to the customer (platform and online communications, ticketing systems, etc.).	Process Design, Process Flow, Inventory Management, Resources Planning, Sales and Operations Planning
5. If you have to ask...	The viewing of process systems in a language other than one's own allows us to see the utility of signage that is not language specific, as well as to more clearly see the way in which consumers are introduced to and processed through the respective systems. Experience through encountering public transportation systems, ordering in restaurants, etc. enables one to more clearly view attributes of the process and to identify needed areas for clarification of action/choice for customers.	Process Design, Service Layout, Scheduling, Sales and Operations Planning
6. How many steps does it take to make a chocolate bar?	The experience of touring a chocolate production factory enables viewers to appreciate the challenges of a dispersed supply chain, environmental and sustainability issues, the phases involved in lean production and the connection between inventory, sales and operational planning.	Resources Planning, Sales and Operation Planning, Inventory, Production Design, Product Design, Scheduling, Sequencing
7. What color is your hamburger chain?	The review and encounter of numerous international brands, compared to the processes of well-known American brands such as McDonalds, allows not only for the identification of layout, service design and product design issues for the American firm, but also a clearer appreciation of competitor overlaps.	Product Design, Service Design, Capacity, Facilities Design
8. What happened to Joey?	When group members are separated from the team, the ability for discussion of the breakdown in process controls to service delivery is possible. The challenge of managing this constraint is enhanced by the linguistic and communications challenges posed by this setting.	Process Planning, Scheduling
9. How long does it take to get to Madrid?	The experience of breaking down the process requirements for getting groups of assets (people) to and from locations together can be explored in the context of the group transfer between countries. This process allows students to transfer knowledge about forward thinking and backward planning for all Resource Planning issues.	Resource Planning, Scheduling, Process Design
10. Why does it matter how fast Sallie walks?	The movement of a group in the international travel program helps to set up a wonderful discussion about the proximity of arrival between the first and last units, the ability for distractions and bottlenecks to arise, and the needed adjustments to develop in processes to adjust for variations in pace and other factors to arrive at successful outcomes on ongoing basis.	Process Design, Queuing, Scheduling, Lean Systems

As a result of the insights presented in Table 4, we came to a list of activities that can help to translate such experiential engagement to a traditional classroom, thereby increasing the derived benefits of both increased diversity and experiential learning in the operations management classroom. Please see Table 5 for these activities and the resources that they involve.

Table 5: Activities for the Traditional OM Classroom Inspired by the Experiential Study Abroad Encounters

Activity	Suggested Resources
<p>Discussion Focus: Layout</p> <p><i>Activity:</i> Review the awards presented to Juwi and the video on its headquarters layout. Then visit one of several types of organizations and diagram the layout they use, identify their core business, and mission focus. Answer the following questions: How are layout designs affected by the mission and activities of the company? How the layout of other buildings with different capital/labor intensity and mission focus (e.g., classroom building they are in, fast food restaurant, and doctor's office as examples) each seek to fulfill the mission of the respective organization, and compare Juwi's layout and its mission. How do they differ? How are they the same?</p>	<p>View overview of awards presented to Juwi at http://www.juwi.com/juwi_group/awards.html Take the virtual tour of the layout and design of the company's headquarter's building at http://www.juwi.com/juwi_group/locations_worldwide/woerrstadt.html</p> <p>Review also the article about different McDonald restaurants in http://news.travel.aol.com/2010/09/03/mcdonald-s-international-top-ten-most-unusual-around-the-world/</p>
<p>Discussion Focus: Production Design and Sustainable Supply Chain Practices</p> <p><i>Activity:</i> Diagram the supply chain inputs and sources for chocolate bar production, using the video noted. What problems and challenges does the complex set of supply chain relationships cause in the process? What can be done by firms to manage these challenges ethically and with competitive success?</p>	<p>View video: http://www.youtube.com/watch?v=Gk876AAN1g (Chocolate Modern Marvels national Geographic Documentary)</p>
<p>Discussion Focus: Queueing Systems Differences</p> <p><i>Activity:</i> Discuss the reasons for the queueing system in the video. What are the impacts on facility layout and support services for this system? Find an example of at least one example of a different approach to queueing. Compare it to models you are familiar with and with the approach used in the video.</p>	<p>Review videos below:</p> <p>The Incredible Queueing System at Japanese Football Game http://www.youtube.com/watch?v=2ztzgvzAM0Q</p>
<p>Discussion Focus: Resource Planning, Constraints, & Scheduling</p> <p><i>Activity:</i> Using the resources noted, plan a trip with your team members to Madrid, Spain. You are responsible for developing a comprehensive trip for a group of 14 people (9 male students and 5 female students) and 2 faculty leaders. Identify your constraints by asking questions on a piece of paper to your faculty leader. Incorporating those constraints explicitly into your planning, prepare a full agenda for the experience and be ready to share your understanding of the constraints, along with your planned trip with the class. Teams can be evaluated on how well they meet constraints and offer the most compelling program will be awarded bonus points. By placing the dates in question over a national holiday, incorporating clear activities that need to be on the schedule, constraints for how many can be in a room, length of trip, overall budget, etc. you will find multiple different types of proposals, including some that may outsource the whole thing. Moreover, students could be asked to include such issues as navigation through airports, immigration and customs, and process for managing group goals and agendas if a member goes missing. These decisions, identification of the constraints, and approach to resolving the conflicts can be the basis of discussion for resource scheduling issues.</p>	<p>Travel booking sites Activity sites</p>

5. Discussion and Conclusions

The value of experiential learning has been widely recognized. This paper explains the process of applying these concepts to the area of OM in a study abroad context. Learning about the theories and then actually visiting production and service facilities let students learn and actually evaluate live examples of the theories' applications in multiple contexts. This process allowed them to become more critical consumers and observers of OM processes and outcomes, and thereby increase their skill sets as future business leaders. Ultimately, students began to realize that everything they experienced was a process that could be influenced by businesses or government and that the formalization of this process depended on the cultural and institutional settings within which the process was grounded. They learned to evaluate and assess the attributes of these processes which will enable them to more effectively plan and deliver processes and production experiences in the future.

Results from the two types of assessment conducted yielded several important conclusions. Students could use the experiential approach taken in a study abroad course to develop, retain, and apply OM concepts, refuting the arguments by Feinberg (2002); however, students' abilities to retain and expound actively on all topics included in the OM course was not all-inclusive, so further measures and articulation of clearly developed assignments may enable even greater focus on key learning outcomes and application in the OM course when offered abroad. It was intriguing to note that students in both the traditional on-campus course and the study abroad course felt that textbook supplementation was at about the same levels, which should lead future instructors and course leaders to identify support materials being used and their linkages to class learning outcomes. Students' overwhelmingly significant and positive reporting of increased learning not only in comparison to other courses within the focal college of business but also within the focal university indicate that the value of the study abroad experience is not solely academic learning, but also personal learning. The limited recognition of issues clearly evident in a heavy manufacturing setting were also notable, and caused us to include in the following year's program a visit to such facilities to provide a greater foil to the service operations settings more readily apparent to them in the course of the travel study program.

This experience has enabled the college to focus on a more clearly defined set of learning outcomes for this course in upcoming study abroad programming based on the early indications of the strongly positive outcomes of this program noted above. It also clearly reinforced the clear applicability of the operations management course to a study abroad program setting, as it demonstrates real-world knowledge and skills that are easily transferred to other business situations. In addition to helping each student participant to see how operations practices are both different and similar in settings in different

countries, the opportunity also provides the job candidate with increased potential for their association with the businesses after graduation, since all now have direct contacts with leading individuals in the organizations that the group visited. Raising the ability to transfer such learning to the student in the traditional on-campus OM classroom was attempted through both clearly identifying moments of learning and application that stood out within the program to both instructors and students, but also developing and sharing specific activities that could help transfer some similar moments of truth to students in the traditional on-campus OM classroom.

Suggestions and future research is encouraged to evaluate the materials and methods used to present the initial theoretical and application of OM materials to students prior to study abroad, and to broaden the attention to project management and other areas with low inclusion in final reports by the students in this study abroad OM course. Furthermore, greater detail of the level and type of applications of OM concept areas shown in Table 1 to be included in the study abroad program final report can be identified with further research then evaluating whether that approach was more successful in identifying and applying activities across a broader spectrum of OM content areas. Finally, comparisons could be made of more similar assignments targeted toward application-related exercises in traditional on-campus OM classes with those of students engaged in the more experiential study abroad OM classrooms to more fully explore how much of the reported extra learning is academic versus personal. In any case, it is clear that this approach bears further attention and focus as a means of engaging students actively in both the conceptual framework of operations management and the appreciation of cultural and institutional diversity that crafts the global business environment.

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