IT 697 Executive Brief

Michael Surdek

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Southern New Hampshire University

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**THE EXPERIENCE**

This experiential learning activity has served as an introduction and an opportunity to explore the SQL programming language which is widely used by organizations to store, manage, and retrieve information from databases. Over the last nine weeks, I have gone from having never even seen a basic SQL clause to being able to write complex queries, create relational database tables, produce results that solve problems based on real-world data, and communicate the process and those results in a clear and concise manner. Between web and video tutorials focused on specific SQL concepts, extensive self-practice, discussion forums with my peers, and various other resources, I have developed a foundation of knowledge and skills that are critical to becoming a competent data professional.

I chose to pursue this opportunity with the hopes of acquiring skills that might increase the value I bring to the table in both my current role and my future career. The company I work for right now, Sovos, is a tax compliance software company whose products are built on SQL. I am a part of the Compliance Services department, which is always looking for people who have knowledge and experience in SQL to work on our Data Management Team in order to improve our products and integrate our ever-changing database and tax compliance requirements. One of my goals for this experience was to develop SQL abilities that would allow me pick up projects and responsibilities with the Data Management Team at Sovos. Additionally, I understand that SQL is one of the most common requirements for data analyst professionals. Although I aspire to eventually obtain a position where I am using statistical methods and visualization tools to guide business decisions, I believe that knowledge of SQL and relational databases separates a good from a great data analyst. For this reason, I undertook this experiential learning activity knowing that it will benefit my professional career for years to come.

**APPLICATIONS OF THEORIES AND PROGRAM COMPETENCIES**

All graduate courses, including this experiential learning activity, expose students to theories and concepts that are at the forefront of today’s world. With these theories and concepts in mind, students can develop competencies which prepare them to face any challenges that they might find in business using strategies and methods that have proven to be effective.

Throughout the process of learning SQL in this experience, the themes that appeared repeatedly were problem solving, the drive to learn and the initiative to practice, exposure to new tools and technologies, and communicating well with others. In fact, I have recently interviewed for a data analytics co-op position and I was told that, besides technical and mathematical skills, these concepts are exactly what they look for in potential candidates. Along with the weekly guidelines and course requirements, the activities that I spent most of the time on during this experience have been based on these concepts, each of which has helped provide the framework for developing some of the ideal competencies of the MS Data Analytics program.

The ability to understand and solve complex problems is one of the most important outcomes of the Data Analytics program. To be able to solve problem using data, one must not only grasp the scenario and what exactly is being asked of them, but also must be in tune with the information available to them as well as their own arsenal of tools. The activity that demonstrates this the most in my learning experience was solving SQL practice problems based on a movie rental database on sqlpad.io. I was ultimately able to answer 59 of the 80 total practice problems, which landed me in 2nd place in April’s Spring Sprint Challenge with 190 points, as shown in the outcome matrix below. It was a slow and steady process, but my problem solving skills improved noticeably. Each week I was able to solve problems that I could not the week before, and I eventually even solved a significant amount of medium and difficult level problems to earn more points. With this experience, I learned the importance of being able to understand what each question is asking and becoming familiar with, in this case, the database tables that I could use to product the correct results. Additionally, this experience required a lot of self-driven motivation to learn and practice. I discovered that it is ok to come across a problem that you do not know how to solve if you then take the time to research the skills that are necessary to solve it. For example, a lot of the problems involved working with dates, and at first, I had to skip them. Although it was not something that we explicitly covered in any week of the course, I used resources that I had become familiar with throughout the course in order to explore functions such as DATE() and EXTRACT(), which helped me solve many of the practice problems that involved working with dates.

Another activity I worked on that demonstrates the Data Analytics program competency of adapting and implementing innovative methods, models, and technologies is my project of converting an organization’s written database requirements into a SQL database table schema. Based on my learning experience, SQL is about more than just writing queries to interact with a database. To be considered proficient at SQL, it is required to understand relational databases that apply to the real world. For my project, I took database requirements for a hospital and developed the tables and relationships in our APEX Oracle environment, as shown in the outcome matrix below. This project introduced me to uses of the SQL programming language that were otherwise outside the scope of this experiential learning activity. It showed me that these technologies are often more versatile than they initially appear, and that learning can sometimes be about figuring out how much there is that you still do not know.

Finally, the third MS Data Analytics program competency of communicating with professionalism, accuracy, and transparency is best applied through each course’s weekly discussion threads. The experiential learning activity was different in many ways from a standard course, but fortunately there still existed the opportunity to share and discuss with my peers on a regular basis. The discussion page is a helpful aspect of these online courses because it is not only an opportunity to share my thoughts and the work that I have done, but also to hear ideas and see projects from many of my peers who are making interesting and unique posts and comments. These comments can point out something about my work that I did not notice. They can show me something that could be improved or where I could have been more clear. A lot of comments even pose a question that I had not considered and allow me to go further into my analysis. Every week with a discussion page is a tremendous opportunity to apply the third program competency of effective communication.

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| --- | --- | --- | --- |
| Outcome # | Description | Explanation | Screenshots |
| MS.DAT.06 | Employ applied, contextual knowledge of an organizations industry to target new data opportunities that improve an organizations competitiveness, effectiveness, and longevity | Solved 59/80 movie rental database practice problems on sqlpad.io such as “Top 5 most rented movies in June 2020” and “Customer spend vs average spend in the same store” | Graphical user interface, application, chat or text message  Description automatically generated |
| MS.DAT.07 | Adapt and implement innovative methods, models, and technologies that allow for adaptability to new and unexpected changes and improve the agility of data analytics projects | Converted sample hospital database requirements into a conceptual model and created the actual tables and relationships in our APEX Oracle environment | Diagram  Description automatically generated |

**DISTINCTIONS**

This experiential learning activity was unlike any course I have ever taken. In most courses, you are handed specific learning resources, assignments with standard grading criteria and rubrics, and evaluations such as tests and projects. This learning experience, on the other hand, provided general weekly topics and a few resources to serve as starting points, but the rest was left up to me. There was much more freedom in this experiential learning activity, and that freedom came with additional responsibilities. For example, when I was relatively familiar with a weekly topic such as joins, I would have been able to easily complete the assignments and move onto the next week in a typical course. However, in this experience, the onus was on me to review what I already knew about joins and to take my learning to the next step with additional resources and practice. The main difference is that instead of being assessed on how much information I could gather and retain, the only thing that mattered was what I put the effort into learning and how I could relate it back to my overall journey, goals, and aspirations.

The significance of the distinctions between this course and most others is most evident in the fact that the experiential learning activity is more similar to my overall learning journey and experience as a professional. In the real world, you are not handed every bit of information that you will need for a project and there is no place that is a one-stop shop for all the directions and answers. Instead, you must combine what you already know with the limited resources you already have in order to determine what your next step will be. Occasionally in this course, I felt somewhat lost at the beginning of the week. This is quite normal at the beginning and at various stages of real-world projects. I was not exactly sure where to start, but this experience has shown me that I just needed to search for new resources and let them guide my discovery.

**FUTURE DIRECTION**

Overall, I am satisfied with the results of my first experiential learning opportunity, but given another chance, there are some things I would have approached differently. Fortunately, I am pursuing another experiential learning course in Python, and I will apply what I have learned here to get the most out of the experience. One thing I have discovered throughout this course is the importance of getting started early in the week and staying ahead of schedule. This not only allows me to manage my time better, but it enhances my ability to fulfill one of the key concepts from these experiences, which is reflection. I have learned that you cannot really control your thoughts and reflections as much as you wish, so the best way to improve reflection is to provide as much time as possible for your thoughts to present themselves to you. For this reason, it is not only important to spend enough time on activities early in the week, but also to do so early on in the semester. In the first few weeks of this course, my timesheets fell below the required 8 hours per week pace. If I could do the experience over, I would have gotten ahead of the recommended pace in order to improve the quality of my reflections, overall learning, and projects later on.

Another thing I plan to do differently in my next experiential learning activity is based on feedback that I received from my professor on my reflection journals. This valuable feedback pointed out ways that I could improve the articulation of my thoughts and ideas, through incorporating more citations from scholarly sources and better formatting methods such as level one headings. These articulation skills are critical when it comes to how you represent yourself. Without citations, your opinions do not have the support they need. If your formatting causes the reader to become lost in blocks of text, it is difficult for them to understand your main ideas. I have tried to implement the feedback that I have received as the experience has progressed and I plan to be better in this respect in my next experiential learning activity.

There were plenty of things that I planned to accomplish at one point in this experience but never got around to completing. I had ideas for projects such as automating a fitness plan, building an application with SQL, and creating some sort of live standings. These all would have been great examples to demonstrate the program competencies that I developed in this experience. Additionally, for my database requirements project, I wanted to take it to the next level by creating sample data, inserting it into the tables, and running queries to provide results to example questions based on the hospital database. Unfortunately, after I created the sample data, I discovered that the APEX Oracle environment does not allow us to insert data. If I had been able to complete this project as intended, I believe it would have demonstrated a complete understanding of the basics of SQL, which is extremely valuable in a professional setting.

My experience in learning SQL was directly related to other courses I have taken in this program. Each of these connections provides a deeper understanding of what it will take to accomplish my goals of becoming a data analyst. First, the database knowledge that I acquired in this experience built on what I learned in my Enterprise Data Management course. In that course, I was introduced to data models and how complex data is managed throughout large organizations. Everything I had learned was highly theoretical, so it was not until I explored SQL in this experience that I understood how the data itself was actually entered into the overall framework. Second, I was able to draw parallels between this experience and the rest of my academic program which is mainly based around the programming language R. I realized that R contains similar capabilities of many of the topics that we covered in SQL. There are many common functions between the languages such as SELECT, filter/WHERE, GROUP BY, ORDER BY, and others. The final connection that I have made is between set operators and elements of basic probability. Essentially, the UNION operator can be thought of as OR and the INTERSECT operator can be thought of as AND in the way that AND/OR are used in probability. Seeing these connections between SQL and the rest of my academic program strengthens my understanding of key concepts that are essential to data professionals.

I hope that what I have learned through this experience will continue to benefit me in future professional opportunities. I aspire to use data analytics to guide business strategies and decisions. It is easy and sometimes impressive to use flashy and pseudo-scientific methods to accomplish this, but these are often not very sound and will almost always eventually produce poor results. It is important for a data professional to be both well-versed in technique and diligent in research and effort. This opportunity has not only provided me with SQL skills that will improve my technical abilities, but it has also shown me how to effectively solve problems, maintain a drive for learning, explore new tools and technologies, and communicate well with others.

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