

Ignatian Spirituality in Organic Chemistry?

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Introduction

As a Xavier chemistry major myself from 2001-2005, I should be well versed in the gifts of Ignatian Spirituality. Looking back on my experience, however, I recall hearing about them during Manresa... and that's about it. I don't remember them being discussed much in my classes, especially not my science classes. It's possible I wasn't attuned or paying attention to them, and it's possible instructors in the physical sciences could be more purposeful about sharing the gifts of Ignatian Spirituality with our students.

Students taking my organic chemistry course are not necessarily expecting Ignatian Spirituality when we talk about the various reactions. But why shouldn't they? Are the physical sciences and the gifts of Ignatian spirituality mutually exclusive? I don't think so, and I investigated where and how students experience the gifts of Ignatian Spirituality (Magis, Reflection, Discernment, Cura Personalis, Solidarity and Kinship, and Service Rooted in Justice and Love) in the physical sciences broadly, and organic chemistry specifically, at Xavier University.

My goal with this project was to demonstrate to students that the gifts of Ignatian Spirituality are present at all times, in all places, including the physical sciences. I hoped to reach students who, like me, haven't been tuned into these gifts since Manresa. For those students, they will at least have had the gifts presented to them a second time about halfway through college, and hopefully they will find these gifts in their other physical science courses.

Overview

My project was split into three parts. First, students were asked to choose one article written by professionals reflecting on their chemistry courses. The first article was a *New York Times* article by Barbara Moran¹, who entered medicine as a second career and took organic chemistry in her 40s. She describes her experience and lessons from her time in the classroom. The other article was Dr. Adam Bange's reflection from a previous year of this mentoring program². He discusses his use of Ignatian Spirituality in his classroom. After reading one of the articles, students wrote about any gifts of Ignatian Spirituality they thought these professionals found in their experience with the chemistry curriculum.

The second assignment asked students to interview a current or former Xavier organic chemistry student. Interviewees were given a list of the gifts of Ignatian Spirituality and asked to think about them for a few days. The interviewer interviewed the interviewee about one gift of Ignatian Spirituality they have seen in their Xavier science courses. The interviewee was asked where they saw that gift in their classes and how it impacted them.

The final assignment asked students to reflect over their two semesters in organic chemistry, pick three gifts of Ignatian Spirituality they found in organic chemistry, and write about their experience with those three gifts.

Results

Assignment #1: Writings by Professionals

Neither Ms. Moran's nor Dr. Bange's articles specifically mention any of the six gifts of Ignatian Spirituality; however, students had little trouble finding the fruits of those gifts in each. The most common gifts found in Moran's article were Reflection (22% of responses) and Discernment (22% of responses). One student noted that "Moran shows resilience and determination when she makes the choice to work on organic chemistry instead of slacking off. By doing so, she shows her son how to have a good work ethic and to not give up when things get hard." A great lesson for Moran, and hopefully one internalized by the students as they read her words.

Magis, Cura Personalis, and Solidarity and Kinship were reported nearly identically from Moran's article (17%, 15%, and 15% of responses, respectively). Students were able to see how these values apply to classes other than just organic chemistry. In writing about Magis, one student noted that "Having this ability to work through long hours of studying, frustration, and confusion builds resilience to help us to perform at our best even in other subject areas." In summarizing Moran's article as a whole, another student summarized that "one does not think about which Ignatian values are being checked off each time a decision to do something is made. That is what is beautiful about the values, themselves. They inspire us to do things that align with what they stand for unconsciously. They are taught and then they become rooted within our conscience and influence our thoughts and actions."

I found it interesting that, except for Service Rooted in Justice and Love (9% of responses), all of the gifts were cited at approximately the same response rate. I hope this showed students that all of the gifts of Ignatian Spirituality really can be found in all situations, if you choose to look for them.

When reading through Dr. Bange's article, students found Reflection prominently represented (37% of responses). Bange attempts to show students the connection between the material in a variety of classes, and students picked up on that. "In order to prevent students from simply memorizing large amount of meaningless formulas and definitions in order to achieve a certain grade in the class, Bange promotes students to reflect on how the chemistry content fits into other disciplines of their existing knowledge."

Magis accounted for 21% of responses. One student discussed Bange's use of Magis by saying, "Studying the sciences isn't just about knowledge of facts, it's about applying those facts to solve real world problems, to think broadly, and to help others with that knowledge." Cura Personalis tallied 16% of responses, and Discernment and Service Rooted in Justice and Love each were noted with 11% of responses. In a similar way to a student discussed Bange's incorporation of Magis, writing about Service Rooted in Justice and Love, a student commented that Bange wants "students to discover how they can use the information learned in chemistry classes and take action to make a difference in real world issues."

Assignment #2: Interviewing a Peer

When students interviewed another current or former organic chemistry student, by far the most commonly referenced gift of Ignatian Spirituality was Magis (40% of responses). Students often related Magis to the ability to succeed through adversity. Some representative quotes along this line include, "At its core, having a growth mindset is very similar to this aspect of Magis, as it requires you to believe that you can improve, which in turn leads to being receptive to new concepts," "[the interviewee] noted

that when students were not receptive to Magis, they ended up quitting, feeling defeated, and blaming the system rather than working with available resources to take control of one's own situation," and "he struggled at first in organic chemistry, but he's glad it was so hard because it felt so much greater when he rose to the challenge."

Solidarity and Kinship also stood out with 24% of responses. This makes sense to me on an intuitive level, especially seeing comments such as "I think the difficult nature of organic chemistry brings people together more than other subjects because people find that they need to lean on each other," and "She doesn't feel like it is competitive here and thinks it is more of a community who wants everyone to succeed including her professors and friends."

Interestingly, and sadly, one peer mentioned specifically that she did not see Reflection or Service Rooted in Justice and Love in her physical science classes. Indeed, those two gifts had the lowest response rate from all peer interviews (8% and 0% of responses, respectively). Clearly, this is an area of growth for me and other physical science instructors. I am surprised that reflection was not mentioned more, but the lack of seeing Service Rooted in Justice and Love is not altogether shocking. Too often in the physical sciences, especially the lower-level classes, we are so focused on cramming in more content that we forget to show students how the sciences fit in to broader justice-related themes.

Assignment #3: Self-Reflection

I was quite surprised by the results of the self-reflection. I expected reflection and discernment to be common themes, given the difficult nature of the course and the hard conversations about majors and careers that often arise. However, reflection and discernment were essentially tied for the 4th and 5th most noted gifts (15% and 14% of responses, respectively).

Those that did mention it, though, had very insightful comments. "I really didn't realize how much I wasn't pushing myself until that was the only option I had so I would be able to stay on top of all my work. Reflection has really shown me how much I needed to take responsibility for the things I was almost half-a**ing and start to work harder than before." "The Ignatian value of reflection in a way that allowed me to pause, reflect, and not let a letter a grade determine my worth and my place within the world." Reflection "challenges us to look at all the nights spent studying, all the eraser scraps from incorrectly drawing mechanisms, all the red ink, and it asks us to consider how these moments made us a better learner, a more intellectually giving person, or maybe even a more humble person." "I know that I am going to have many times in my profession where I am faced with an unfamiliar presentation of a patient, or different molecules, and have to use what I know and what I have seen before in order to determine an adequate treatment for that patient."

The two most common responses were Magis (28% of responses), and Solidarity and Kinship (25% of responses). Again, Service Rooted in Justice and Love was the least noted gift of Ignatian Spirituality found in organic chemistry (1% of responses), showing me a clear area for growth in the future. The comments related to Solidarity and Kinship, like those for Reflection and Discernment, were inspiring. "Working with other people to solve problems has made me more open to listening to other people's ideas and taught me how to use my skills to benefit others." Ever since the first test it has felt like the entire cohort of Organic students this year have been a sort of family." "What has been even more meaningful is how students go out of their way to help each other rather than competing or tearing each other down."

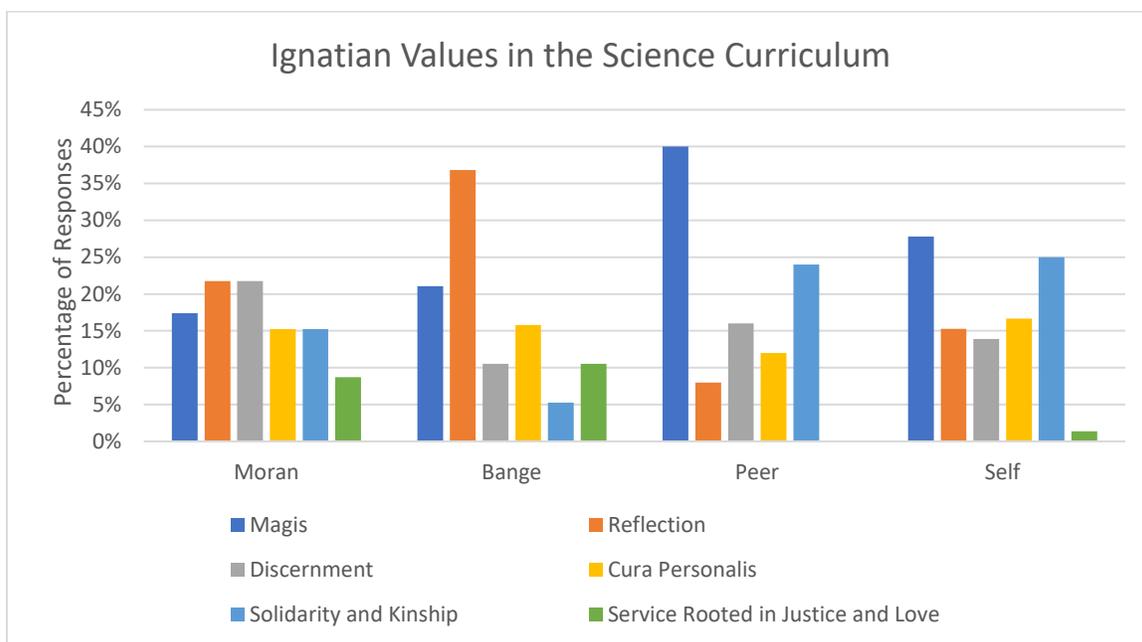
But perhaps the most striking comment comes from a student talking about his experience of Magis over the last two semesters of organic chemistry. “For the better part of my life, I succumbed to mediocrity. I allowed myself to be mediocre in comparison to where I knew I could take my work. That ship has sailed. I have profound new gratitude towards education and the places it can take me.”

Sure, it makes me feel good as an educator to see my students “get it.” But the demonstration of personal growth they showed in this 3rd assignment makes me feel confident that they have the tools to see the gifts of Ignatian Spirituality in the rest of their courses.

Conclusion

Students perceive professionals utilizing Reflection most in the physical sciences, followed by Discernment and Cura Personalis. But students find, for themselves, that Magis and Solidarity and Kinship are most prevalent. This is a big disconnect for sure, but it is less clear what the implications are. Perhaps this demonstrates a gap between what we as instructors think we are doing and what students actually take from our lessons. It could also be that, in the moment, students are concerned about self-preservation, and see Magis and Solidarity and Kinship as a refuge.

Alternatively, students could be primarily focused on grades and the immediacy of the next test, while instructors take a broader view of the course’s place in the curriculum. Students may understandably lack that perspective and don’t see the course the same way we do. Whatever the reasons, Service Rooted in Justice and Love could stand to be more prominent in the physical science courses. Overall, better communication between students and instructors, and more explicit focus on the gifts of Ignatian Spirituality will ensure students see that science courses can be “human,” too.



¹ <https://www.nytimes.com/2013/11/03/education/edlife/how-to-get-an-a-in-organic-chemistry.html> (https://bit.ly/IMP_Moran)

² <https://www.xavier.edu/jesuitresource/online-resources/mission-focused-pedagogy/faculty-work-chemistry> (https://bit.ly/IMP_Bange)