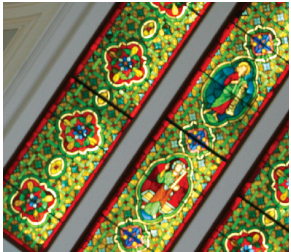




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Mathematical and Moral Development Through Service-Learning

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Our Service Option in Calculus

Recently, we've been piloting a service option in various forms of calculus.

- It is an opt-in option, replacing an essay about mathematics in students' majors.
- It involves tutoring one or two high school students two or three years behind them.
- For most of our students, this is a cross-cultural experience.



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Mathematical Outcomes

Our students were asked, naturally, to reflect on their mathematical growth and goals:

- “I would certainly say that I have come to the end with a greater understanding of the material.”
- “It taught me so much ... about why it is necessary to understand the more elementary areas of math...”
- “It was also good for me too, because I have the tendency to forget algebra stuff.”
- “I really needed to break down what the meaning of each variable was... I found that doing this helped me to understand the graphical interpretations more easily for our class.”



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Why Service-Learning?

And that is familiar – with reason. This session gives many reasons to connect with service:

- Gain experience applying math in real life situations and/or clients
- Improve learning with a hands-on context
- Understand societal and civic realities
- Address community needs

The first two clearly connect to content. But the second two are also a high priority, so students should reflect on this as well.



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Other Outcomes

Accordingly, we asked them to reflect on the relationships and non-mathematical goals.

- “I have always assumed that my teachers bore the responsibility of making a subject interesting to me...”
- “[It] taught me so much about patience, about the importance of a positive attitude ... the dynamics of growing up in an urban setting.”
- “As a tutor, I love to learn about them and just be one to listen and not judge.”
- “What I observed ... [was] that I psych myself out when faced with a difficult situation ... we certainly cannot conquer life on our own.”
- “Most importantly, I learned about the importance of dreams and confidence.”

(Notice that some of these comments are as much about the college students themselves as the social setting or the service.)



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Why Service-Learning?

The responses' nature spurs a meta-question:

- What makes civic engagement, “doing good”, or serving, good for an academic enterprise?
 - Referring to a mission statement simply shifts the question.
- It seems there is an implicit (broadly) *moral* component students are responding to.
- Thus it seems reasonable that students should have the chance to *explicitly* reflect on this aspect of their service.



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Adding Reflection

So we gave them room to reflect on these types of issues as well.

- It was easy and nonintrusive to allow this. At our college, the following language was appropriate, but certainly it is easy to modify:
 - ‘Is the tutoring experience starting to help you mathematically or spiritually, or does it leave you dry ... and why?’
 - ‘How has your experience helped in: communicating math; thinking about citizenship, service, or stewardship of your talents?’



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Adding Reflection

So we gave them room to reflect on these types of issues as well.

- Not all of our students reflected on specifically moral issues, but many did.
- Those who did were passionate about the impact the service had on them.

(Caveat Lector: The language used in the following quotes indicates students' self-perceived authentic experience at a self-described evangelical college; the point in the context of this talk is that students clearly felt deeply moved, and inspired in their ethical core of values.)



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Adding Reflection

- “Spiritually, this endeavor was such a blessing to me ... I felt I couldn’t turn the service learning project down.”
- “I have grown more spiritual ... just by tutoring students, I felt like I humbled myself [and] have used my skills in mathematics for good by helping others rather than just using them for my own benefits.”
- “Overall, my experience ... [was] a blessing ... certainly made me reflect back to my study habits and what should change.”
- “I felt God was challenging me ... The experience has brought me to broaden my views.”

The act of reflection on this, not just describing it, seemed to solidify the value of the experience for them.



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Adding Reflection

- “Another aspect of tutoring ... is the amount of spiritual nourishment I have received ... when tutoring, I feel like I can share that joy and blessing [enjoying math] with other people.”
- “But now, by going to Lynn, I have asked bigger questions. For instance, why is it important to have an education?”
- [The partner organization] “strengthened my faith by providing me with real world evidence of people who are dedicated to helping those less fortunate than themselves.”
- “It was a challenge to be disciplined and consistent ... [but] in order for one to love it takes sacrifice, grace, and patience.”

The point of this talk is to encourage you to give students this explicit chance to reflect on their *moral development*.



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Moral Development and Higher Ed

What is Moral Development?

- Working definition: “Developing a personal code of values and ethics” (CIC, from NSSE)
- This may, but does not necessarily have to, include ‘spiritual development’.
- Key to many references in higher ed is the notion that we want students to graduate being able to reflect on *why* they choose to act (or not act) as they do.



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Moral Development and Higher Ed

Historically this was a big piece of US higher ed, but there is a renewal of interest in sociological/education research circles.

- Colby et al., *Educating Citizens* (2003) – fostering a sense of (esp. civic) responsibility
- University of Indiana NSSE surveys self-reported outcomes in this arena
- Astin et al., *Cultivating the Spirit* (2010) – UCLA longitudinal study of >14000 college students, their attitudes about spirituality



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Moral Development and Higher Ed

This is touted as a boon by many voices, inside and outside of service-learning...

- In its advertising, the Council of Independent Colleges uses NSSE data on this and several related measures to promote private liberal arts education
- ‘[One of the] most fundamental questions about undergraduate education [is] how students acquire [their] values and convictions’ – Derek Bok



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Moral Development and Higher Ed

- Bernacki and Jaeger (2008): service-learning enhanced *self*-perception of moral development, esp. with respect to social issues
- Astin et al.: ‘growth’ (as defined by the study) in several key areas led to enhanced GPA, interest in post-graduate study, and self-rated ability to get along with other groups.
- Rhoads (1997): reinforcing a student’s ‘caring self’ through service requires a reflective component – “How should I be living my life?”



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Moral Development and Higher Ed

Service-learning as an idea can benefit, too.

- First, because it sells itself that way. NSLC: ‘service-learning is more likely to ... generate emotional consequences...[and] to support social ... development.’
- Second, because of justified criticism from within (see e.g. Eby 1998) that many service-learning experiences have an impoverished understanding of need or are unreflective volunteerism



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Conclusion

Conclusions:

- Reflecting in this way enhanced student experience and strengthened their commitment to the larger goals of service.
 - Many students explicitly commented that the program was worthwhile solely for the moral benefit, beyond mathematics or service.
- With forethought, one could contribute to sociology/education research too.

Thank you!