Using Utility Value Interventions to Remove Barriers in Math Courses

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November 16, 2018
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Math pass rates by gender

- Female: 0.75
- Male: 0.50

Legend:
- Red: Female
- Blue: Male
#1. 90 Second Speed Write!

- Think of a student you have worked with who has struggled but you believe could be successful.
- Describe this person.

#2: Turn & Talk

- Stand up.
- Find a partner.
- Discuss the Top 3 Obstacles your student has to being successful.

#3: Group Share

- Share your obstacles with the group.
- Chris takes notes.
Student Obstacles to Success
Value
Students value school for different reasons

**Utility:**
This is useful and relevant for my:
- Daily life
- Future education
- Career
- Interests and hobbies

**Interest:**
This catches my interest. I want to learn more.

**Identity:**
This is who I am. It’s important to me to be good at this.

**Communal:**
This allows me to do something that helps my family and community.

**Intrinsic:**
This is fun! I just like doing this.
Utility Value Experiment

- Sample (N = 416)
  - 57% Female
  - 35% White, 27% Hispanic/Latino, 15% Black, 10% Other
  - Intermediate algebra

- Design
  - Double Blind Randomized Experiment
  - Online Homework Assignments
  - ~43% participation rate
  - Short survey, intervention, follow-up
  - Outcome: Pass Rate
Utility Value Intervention

**Essay Prompts**
- How is math useful in your daily life?
- How is math useful in a future career that you’re interested in?
- How do you use math in your hobbies and personal interests?

**Directions**
- Try to pick a specific topic you learned about recently in your math class and explain how it helped you do something in particular, how it is useful in a potential future career, or is used in your personal hobbies and interests.
On a daily basis, anyone who owns a car or needs to make a purchase will use math. It is helpful to know how many gallons it takes to fill up a gas tank and how much money each gallon will cost. If a person needs to make a purchase, they need to know how to calculate how much they will be spending and verify if they have enough money. -- Gerry, 19, Engineering Major
"As a firefighter/paramedic I use algebra almost every work day. Be it for patients weight and drug calculations, or weights when it comes to building materials... I’ve had to apologize to all my math teachers for my lack of foresight!" -- Robin, 30, Firefighter/Paramedic
Utility Value Intervention

Math in Hobbies

"For me using math is fun especially if you’re using it for something you like. I use it for cars. How low i need the suspension, how wide my wheel setup needs to be, the amount of boost I want, and how many liters of fuel will be coming in the engine. This is the math I find most interesting.” -- John, 19, Physical Therapy Major
Utility Value Intervention

1. Select a topic that is currently being covered in class.

2. Write a one-paragraph essay that applies the topic to your life or a letter to someone you know (control: just summarize).

Graphing is an important part of life…. For an example, my grandmother and aunt work at a retirement home and they need to decide dosages per day, meals, and etc. Graphing out all the data they have will [help them] come out with a resolution.
Utility Value
Intervention

How does it work?
Florida community college student:

“After a hurricane there’s a big chance of losing power and flooding. One way math could help is to try to figure out how much water we might need for daily use. Like how many gallons for me, my husband, and our three kids to bathe, cook, or drink. Every year when we prepare for hurricane season, we could estimate how much water and food we will need for one day, one week, or longer. We would use proportions and statistics to do our calculations. That way we’d know how much money to set aside to be ready in case something bad happens.”
Florida community college student:  

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Florida community college student: **Specific**

“After a hurricane there’s a big chance of losing power and flooding. One way math could help is to try to **figure out how much water we might need for daily use.** Like how many gallons for **me, my** husband, and **our** three kids to bathe, cook, or drink. Every year when we prepare for hurricane season, **we could estimate how much water and food we will need for one day, one week, or longer. We would use proportions and statistics to do our calculations.** That way **we’d** know how much money to set aside to be ready in case something bad happens.”
How does it work?

Florida community college student: Meaningful

“After a hurricane there’s a big chance of losing power and flooding. One way math could help is to try to figure out how much water we might need for daily use. Like how many gallons for me, my husband, and our three kids to bathe, cook, or drink. Every year when we prepare for hurricane season, we could estimate how much water and food we will need for one day, one week, or longer. We would use proportions and statistics to do our calculations. That way we’d know how much money to set aside to be ready in case something bad happens.”
### Who is involved?

- **12,995 students**
  - SP16: $n = 1038$
  - SU16: $n = 456$
  - FA16: $n = 2344$
  - SP17: $n = 1449$
  - SU17: $n = 603$
  - FA17: $n = 2348$
  - SP18: $n = 1949$
  - FA18: $n = 2858$

- **63 Instructors**

- **547 CRNs**
  - MAT1033C: Intermediate Algebra
  - MGF1106: College Mathematics
  - STA1001: Introduction to Statistical Reasoning
Questions?
That's a Wrap
This research was supported by the National Science Foundation, through grants DRL 1252463 and 1228661 and by the U.S. Department of Education, through grant #R305B090002. The opinions expressed are those of the authors and do not represent views of the funding agencies.
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