

What works to motivate students to be self-directed learners in a flipped classroom?

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Context

Two sections of Intermediate Algebra (2 credits, 3 hours weekly).

Online homework problems due weekly (ALEKS software).

Roughly one online lecture or reading per week followed by in-class quiz.

Class time spent working through examples,
either individually or as a class.

Gathering Evidence

Pre- survey and post-survey from Fall 2014 students

Focus group feedback from Spring 2014 students

Questions for First Day of Class

1. Do you have a laptop, iPad, Smartphone, or a similar device that can access the internet?
2. Outside of class, how many hours are you planning to spend on this course per week?

For the questions 3-7, indicate your level of agreement using the following scale.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
A	B	C	D	E

3. ___ My math abilities can develop through effort and learning.
4. ___ I am generally enthusiastic about coming to math class.
5. ___ Math, as a subject, motivates me to learn.
6. ___ After I have finally understood a challenging concept or completed a difficult problem I think, "I finally understood/completed it and want to do another."
7. ___ I can learn any type of math.
8. ___ I am willing to take more than the required amount of mathematics.
9. ___ The challenge of math appeals to me.
10. Do you have any questions or concerns? Is there anything else that you would like me to know?

Figure 1. Pre-survey. Post-surveys replaced questions 1 and 2 with, "What motivates you to learn mathematics?"

Results

Pre- and post-survey showed only one statistically significant result: an increase in the number of students indicating, "I am generally enthusiastic about coming to math class." (P-value: 0.083).

What motivates you to learn math?

Out of 50 respondents:

I just want to. 28%

It helps my future. 20%

It's required. 26%

I want good grades. 18%

Specific Comments

"I feel motivated to learn when things are broken down so they are easy to understand. When I feel like I'm learning and getting what is being taught it's enjoyable."

"I like that with math, the answer is either right or wrong. There really is no grey area when it comes to math."

"Knowing it will help my future"

"Once I've become familiar with a type of problem that I struggled with previously, it becomes an enjoyable process."

"Positive feedback...getting a problem correct wants me to do more."

Focus Group Feedback

Would you choose paper or online homework?

I would choose ALEKS (online) because it's really frustrating trying to do homework and not knowing what you're doing where with ALEKS ... examples and it will show you step-by-step how to do it and that's a lot easier.

What if you think you're doing it right and you're doing the entire assignment wrong?...The paper doesn't stop you; ALEKS will.

What motivates you to do the ALEKS homework and to watch the videos?

It would frustrate me that I did it wrong and I'd keep doing it over and over again until I got it right.

I wanted a thorough understanding of it.

Good grades.

Other comments

I learn better if I'm able to try to do what I can on my own and then come with questions.

I don't like textbooks for math at all. They're confusing.

Conclusion

Before conclusions can be made, more research, including a control group, would be beneficial.

Future Questions

Does the day of the week homework is due impact homework completion rates?

Would a control group show different results?

Would using a different online homework system impact responses?

References

E. Williams, S. Sherrod, and J. Dwyer. (2014) Instructor Immediacy and Motivation for Mathematics Learning, MathAMATYC Educator, 5(3), May 2014.

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