Flipped teaching as a method for boosting engagement and performance

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Background

My colleague, Nick Gurski, proposed replacing lectures with videos as a solution to stubborn attendance problems on our 'maths for engineers' courses.

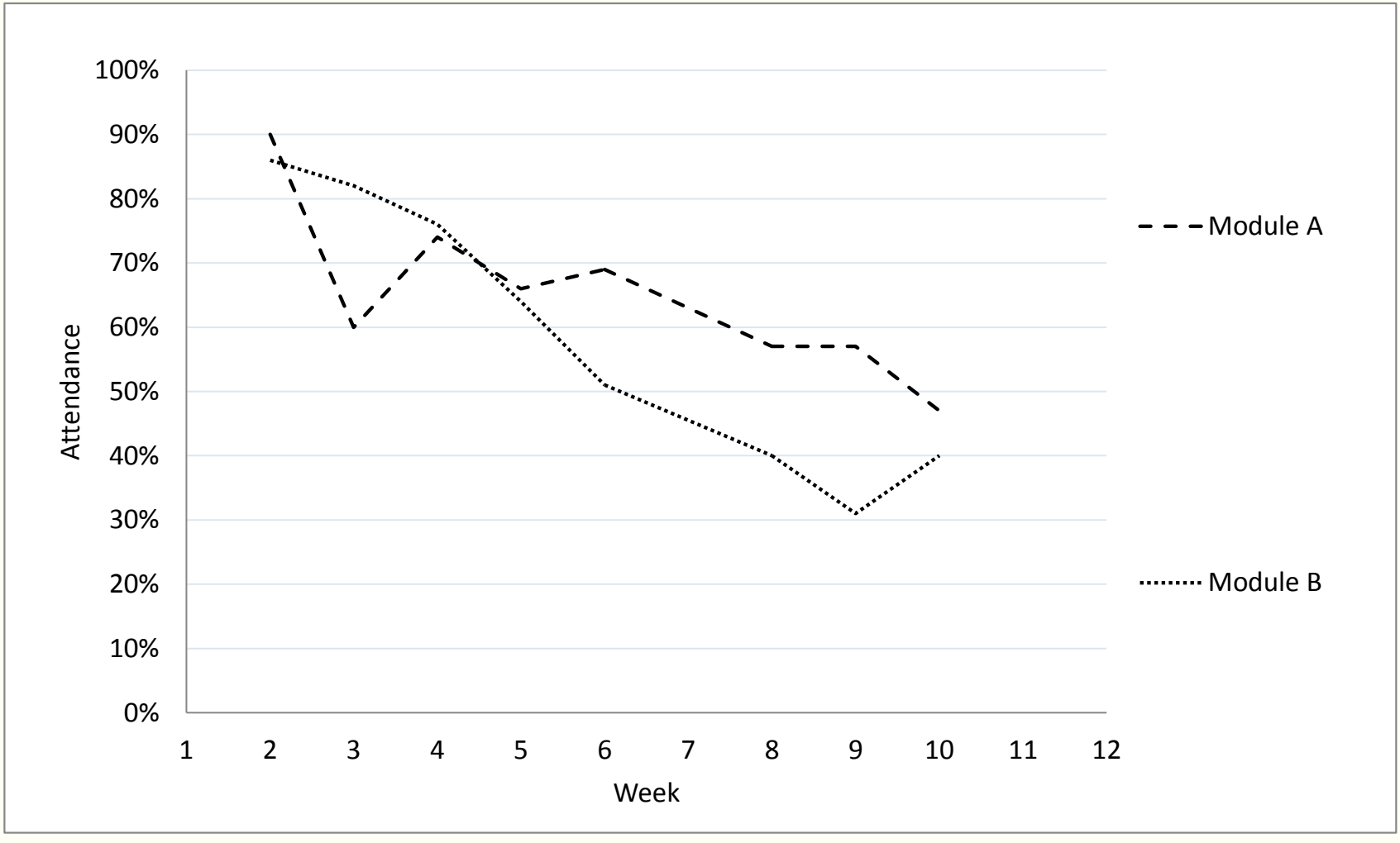

Figure : Problem class attendance on two traditionally taught engineering mathematics modules, Semester 1 2013–14

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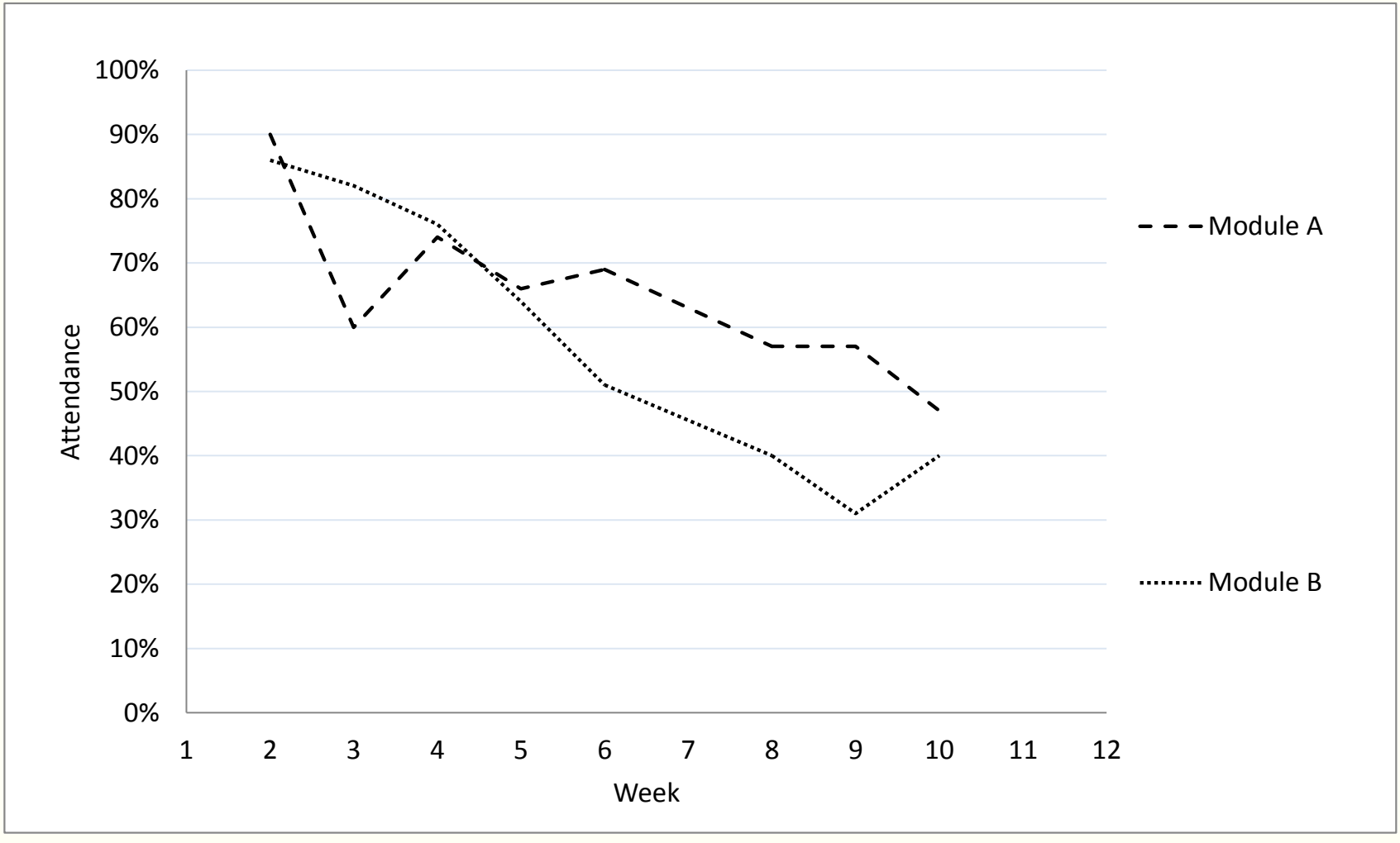
What happened?



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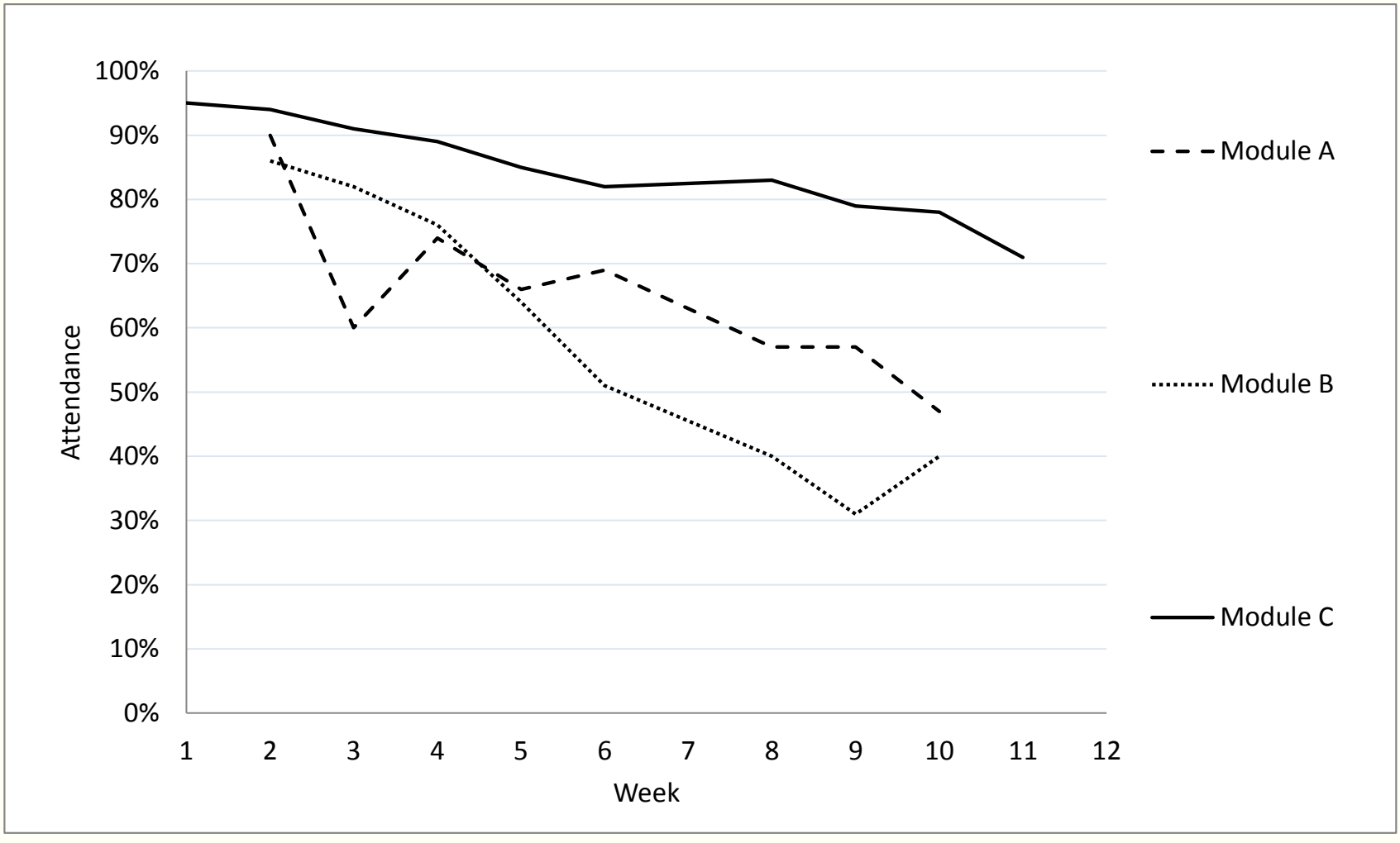

Figure : Problem class attendance, Semester 1 2013–14. Module C piloted in a flipped format; Modules A and B taught traditionally.

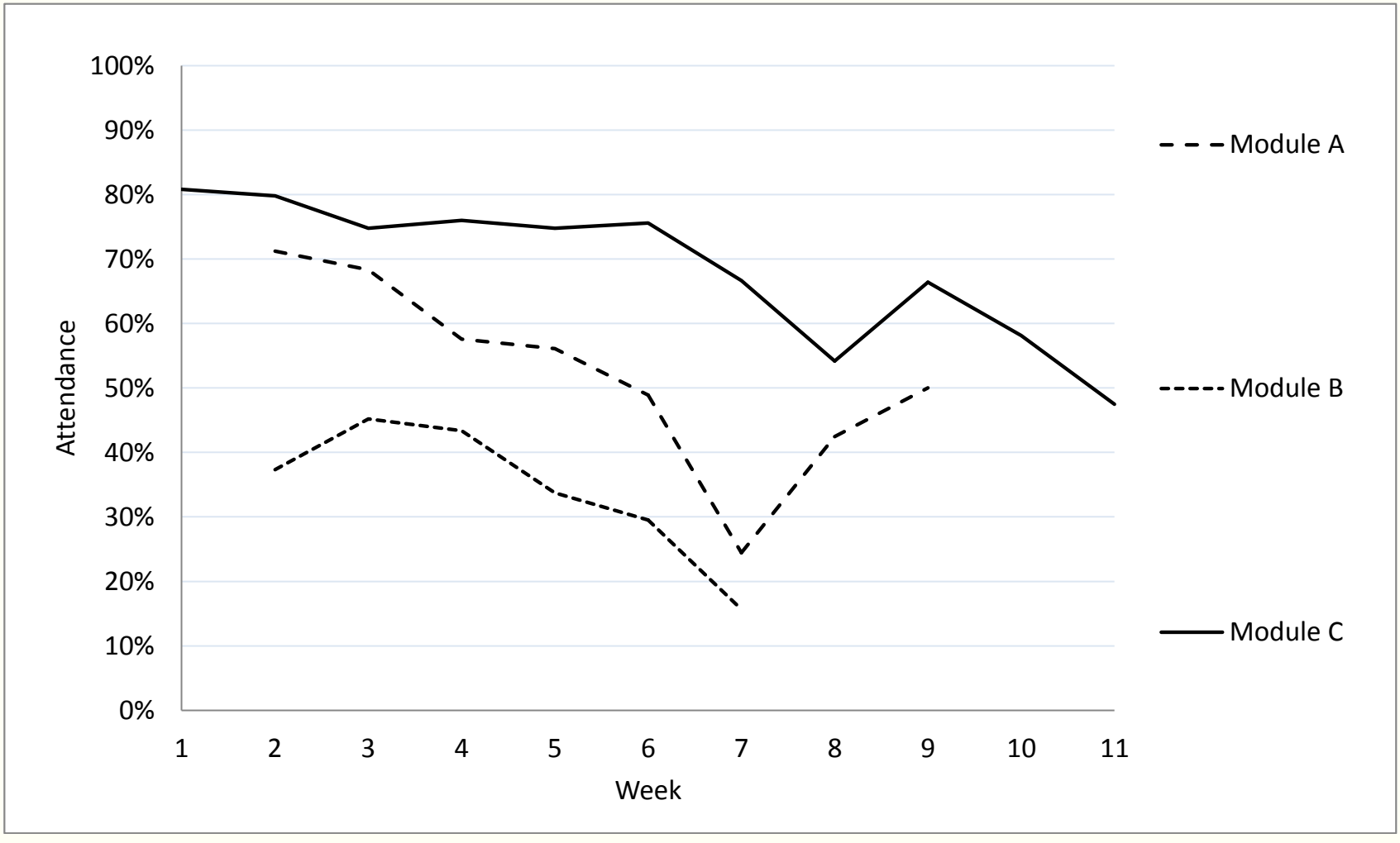

Figure : Problem class attendance, Semester 2 2013–14. Module C piloted in a flipped format; Modules A and B taught traditionally.

So students attended more classes

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But did they watch the videos?

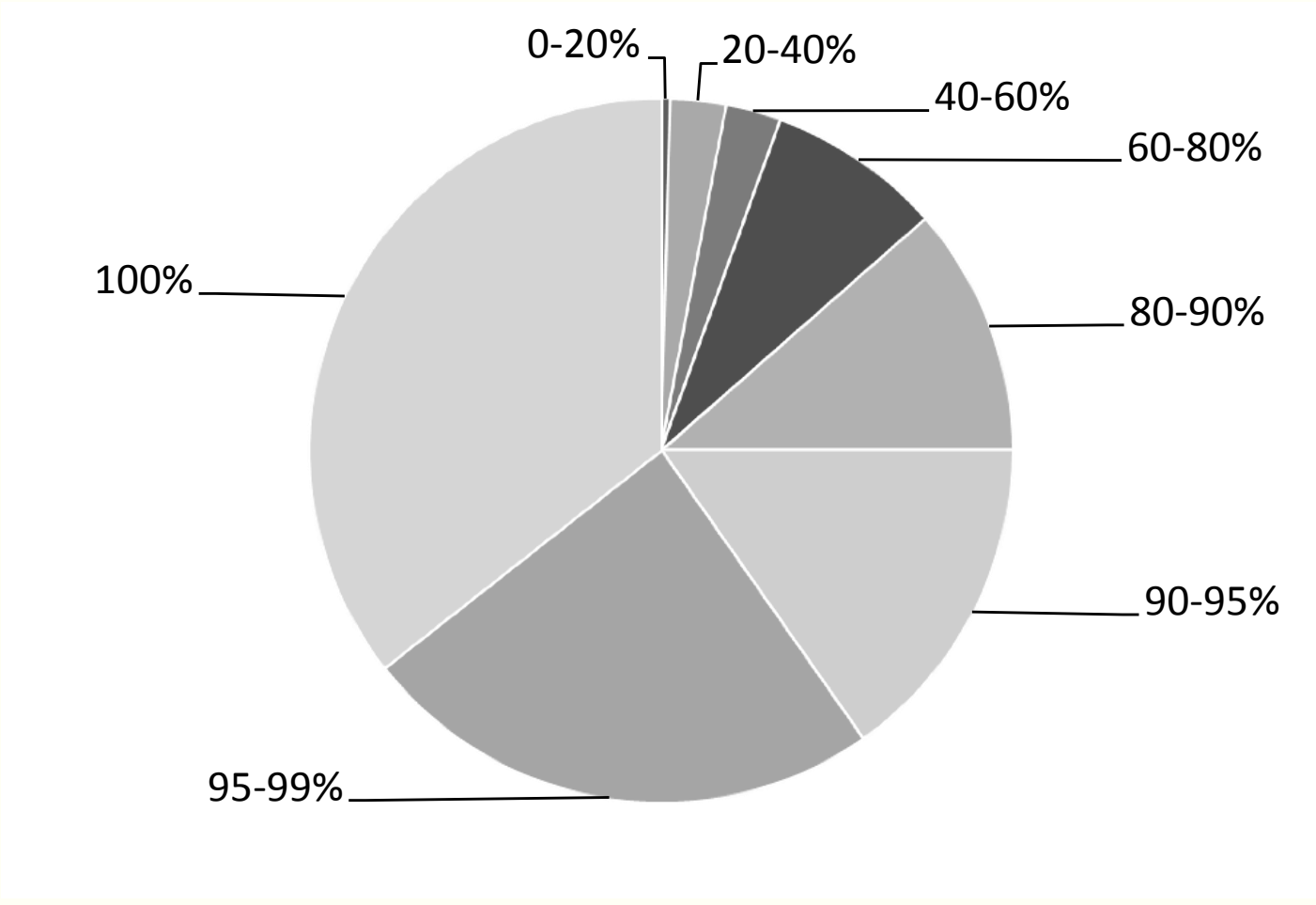

Figure : Proportion of videos watched on time

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But did they like it?

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- 115 of 168 comments mentioned online videos when asked what was good about the module.
- Only 5 comments suggested traditional lectures would improve the module.

Cherry-picked, but not unrepresentative comments:

- *EVERYTHING. I love this style of teaching.*
- *I feel this module is very well done, especially with the usage of online lectures and problem classes, which deeply help my understanding of the taught material.*
- *The combination of video lectures and problem classes is very effective. It allows students to learn when they are most motivated and it enables students to pause and replay the lectures.*

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But did they learn more?

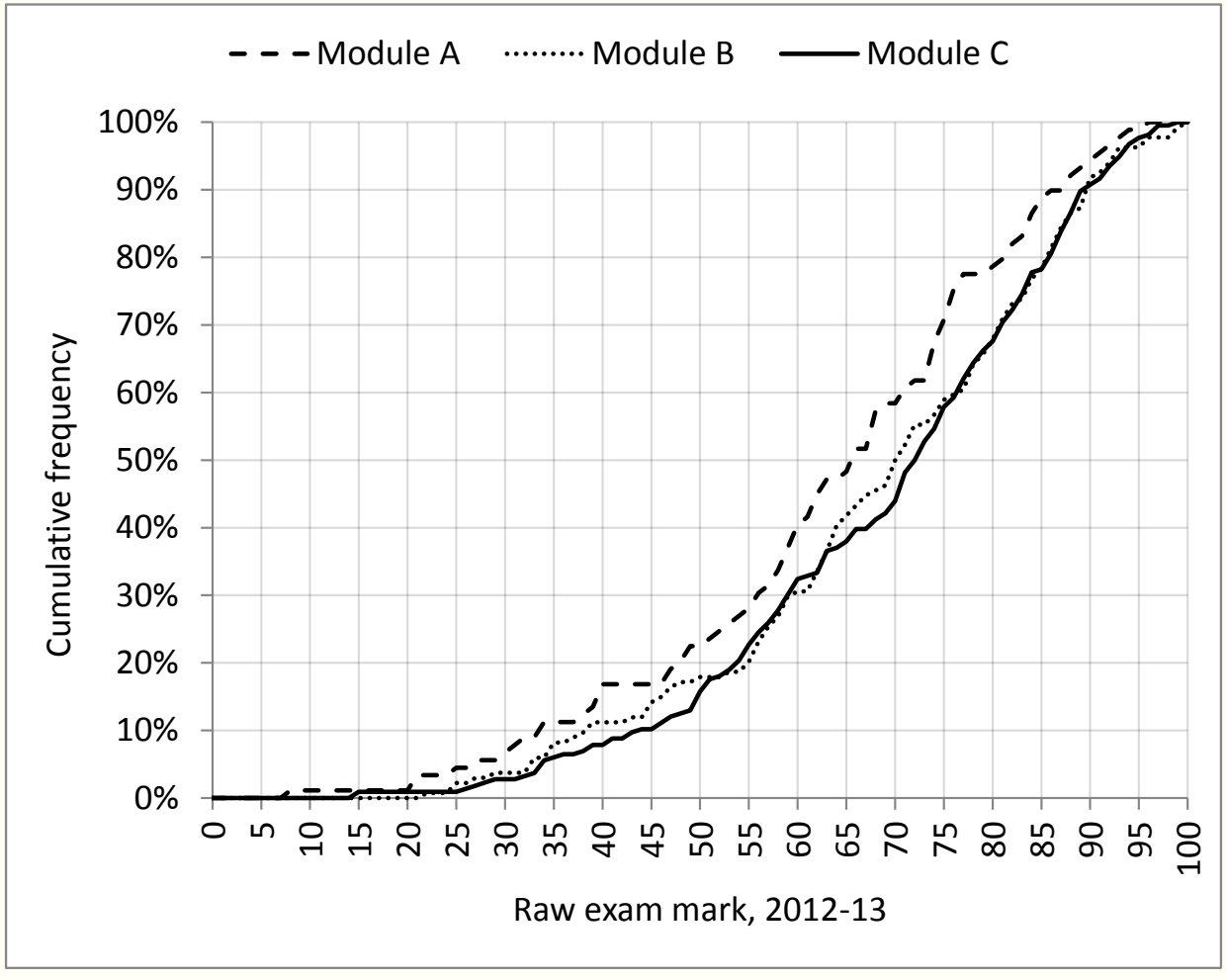
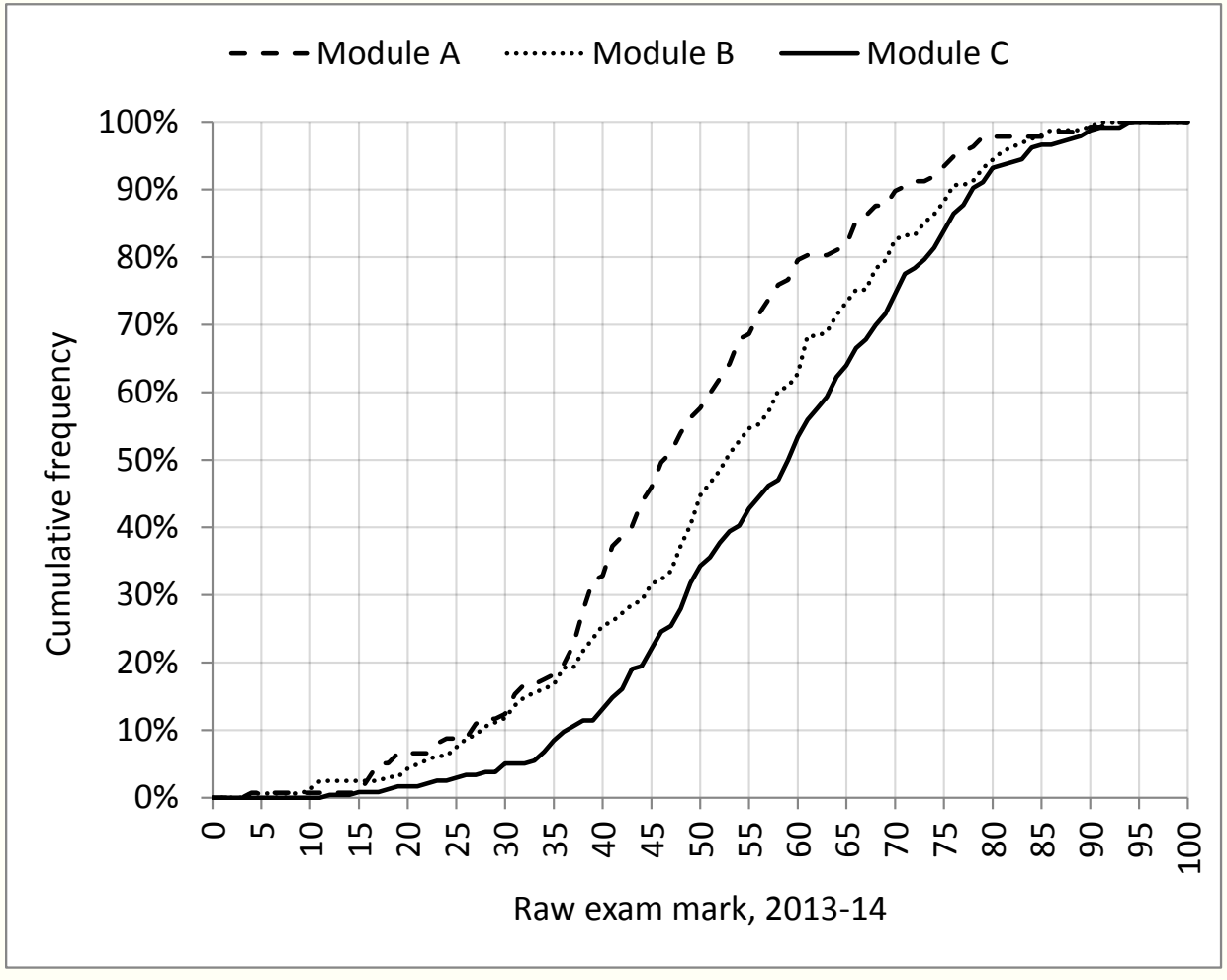


Figure : Cumulative plot of exam grades, 2012–13



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Our analysis controlled for differences in exams year-on-year and performance trends across departments.

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What's the catch?

Nothing major!

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- Increase in staff resources may be necessary but there are efficiency savings for very large numbers.

More information

- More detail in our paper, and application for the Guardian University Awards.
- A Guardian discussion piece 'Are lectures the best way to teach students?' written by me and Nick Gurski.
- The course webpage.
- Try out the video system: `http://goo.gl/M8WwZp` username:`engineering`, password:`letmein`
- Analysis of subsequent years' data to follow in another paper.