

# Learners' activity in MOOCs from a psychometric perspective

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\* Abbakumov, D., Desmet, P., & Van den Noortgate, W. (submitted). Measuring students' activity in MOOCs...



## Problem

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Learners' activity is typically described through the proportions (videos viewed, assessments taken). These measures are simple and intuitive. However, by aggregating the information per learner, **we lose information** on how a learner interacts with individual units of content.

# Research Design

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## Aim

To model **each interaction** of a learner with a unit of content.

## Item Response Theory

considers the interaction as influenced by a latent **learner property** and a latent **unit property**.

## Explanatory variables

are **video or reading** and **a module order**.



<https://www.coursera.org/teach/YOUR-COURSE/analytics/export>

*course\_progress.csv*  
*course\_items.csv*  
*course\_item\_types.csv*  
*course\_lessons.csv*  
*course\_modules.csv*

# >70,000

Learners

# >2,500,000

Interactions



*course\_progress.csv*

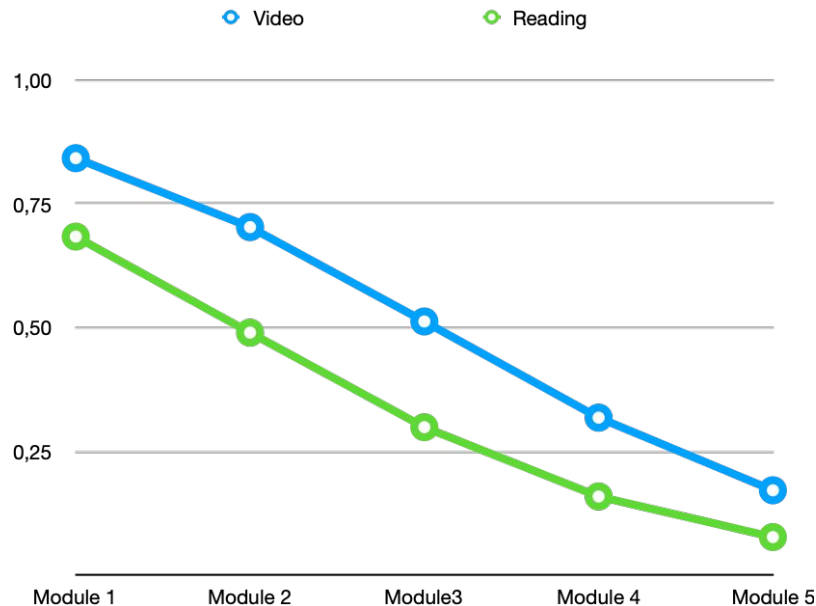
# 3 courses

In cross-validation

# Results

Learners complete **video** lectures **more often** than **reading** assignments.

*Hint!* Include reading assignments in video lectures.

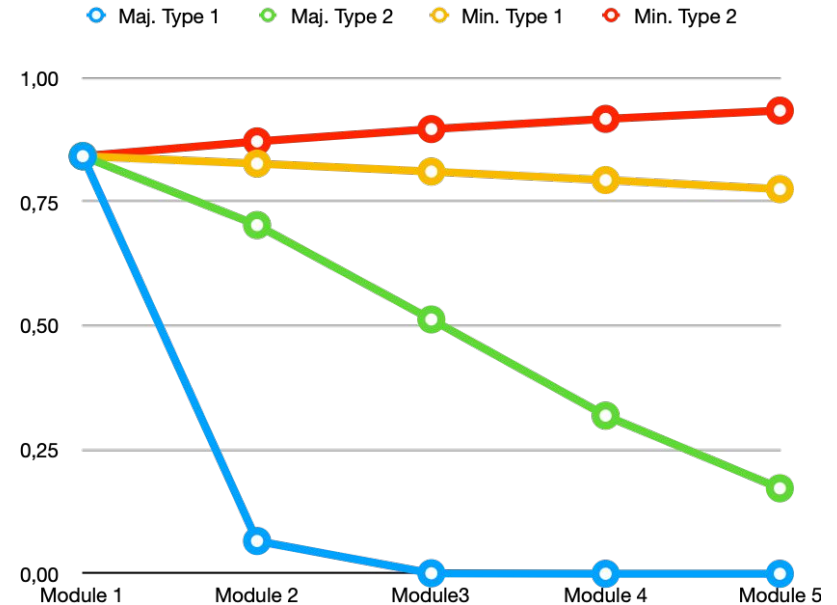


# Results

We have detected three groups of learners: **majority with decreasing activity**, and **minorities with flat and increasing activity**.

The minorities perform better and with a lower number of attempts in summative assessments.

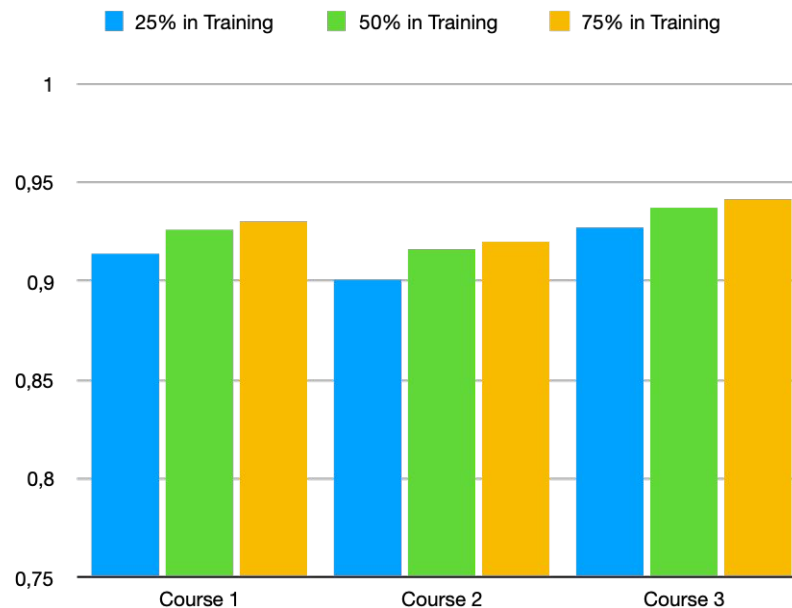
*What next?* To add explanatory variables (background, motivation, interests).



# Results

The proposed approach allows **predicting learners' activity** for the rest of the course based on only one-week activity data **with >85% accuracy**.

The proposed approach can be used for dropout predictions.



# Summary

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1. Learners **complete video lectures more often than reading assignments.**
  - Hint! Include reading assignments in video lectures.
2. We have detected three groups of learners: **majority with decreasing activity,** and **minorities with flat and increasing activity.**
  - The minorities perform better and with a lower number of attempts in summative assessments.
3. The proposed approach allows **predicting learners' activity** for the rest of the course based on only one-week activity data **with >85% accuracy.**
  - The proposed approach can be used for dropout predictions.



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When and why digital learning does (or does not) happen, and how online courses do work?

We are open to cooperation and collaboration.

<https://www.abbakumov.com/lab>

