Learner Paths and Trajectories in MOOCs

DEE Conference 2017, London

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MOOC development raises many questions

Supply and demand of MOOCs

- Supply of MOOCs by platforms is increasing rapidly in all academic fields
- Dozens of MOOCs in economics/business, repeated regularly during year
- Demand is high, but fickle and complicated to analyse

Are MOOCs "efficient" learning tools?

- Why is the attrition rate so high? --> *too general a question*
- Who are the learners and what are their motivations? --> *learners classification*
- What do they want to learn? --> *important as platforms become commercially oriented*
- How do learners handle the courses? --> *how to design courses better*

Learner paths and trajectories

Course design

- So far, no real blueprint of “how to”
  - Design oriented by platforms, but nevertheless “more D.I.Y than Ikea”
  - Linear design for most courses (a path to follow)
  - Social aspects receive more emphasis on some platforms
- Diverse resources
  - Videos
  - Texts

) Passive learning, no interaction
  - Discussions
  - Games
  - Peer-reviewed assignments

) Active learning, more interaction
  - Quizzes
  - Tests

) Evaluation or auto-evaluation

Results: Learner paths

- Analysis made on one FutureLearn MOOC (presented here)

- People do not follow the designed (linear) path
  - Resources skipped, handpicking behavior
  - Backward and forward jumps
- People do not follow the prescribed timeline
  - Weekly design, but all resources available from the start
  - Some slower learners
  - Some faster learners (“binge learning?”)

- What does it imply, where does this lead us?

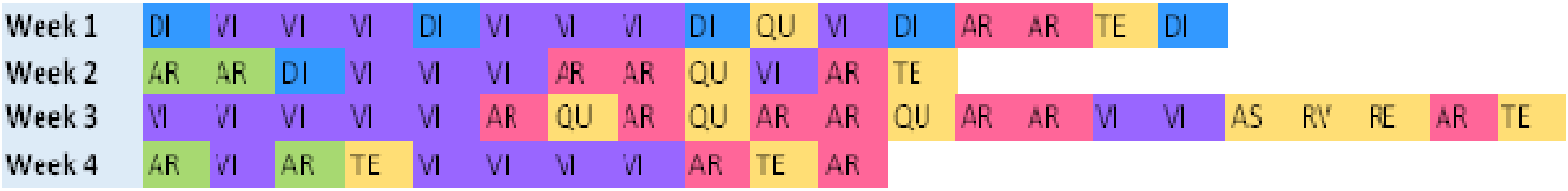
The MOOC: “manage your prices”

- A course hosted on FutureLearn, focusing on *“The economics of price discrimination and revenue management”*
  - First run on 16 January 2017, second on 24 April, next on 13 November
- Standard features in terms of linearity and structure
  - Weeks/activities/steps: 4 weeks, 3 to 5 activities per week, 60 steps in total
- A rather unusual diversity of resources
  - videos, cartoons, text, 4 interactive games, discussions, 1 assignment, quizzes and tests
- A social constructivism approach: learning through conversations with tutors and peers
  - *“telling stories, provoking conversations, celebrating progress” (FutureLearn)*

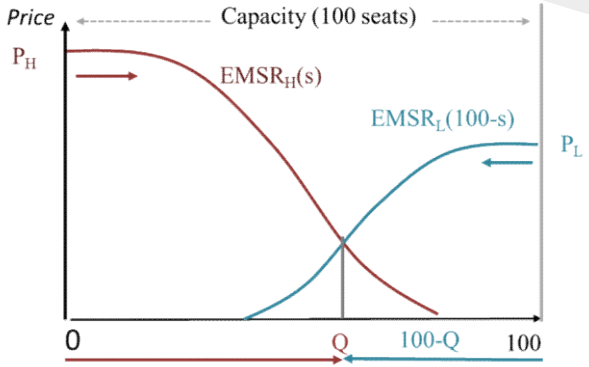
The MOOC: “manage your prices”

Resource Type	FL identifier	Description/Content	# of ste
Article	AR	Articles with theoretical content or week wrap-ups	14
Video	VI	Videos with week introductions, theoretical content, case study cartoons or interviews of experts	23
Discussion	DI	Specific discussion steps (discussions are also present in all steps)	6
Game	AR	The game is hosted on a partner platform, and accessible through an ‘article’ step.	4
Tests or quiz or assignment	TE, QU or AS/RV/RE	We group here all forms of assessment: tests, quiz or assignment	13

Total: 60



The MOOC: “manage your prices”



Some important numbers

- 16 months of development
- Total cost ≈ 170 k€ (financed by the University of Toulouse and ENAC)
- 2 educators, 2 tutors (1h/day during 1st session)

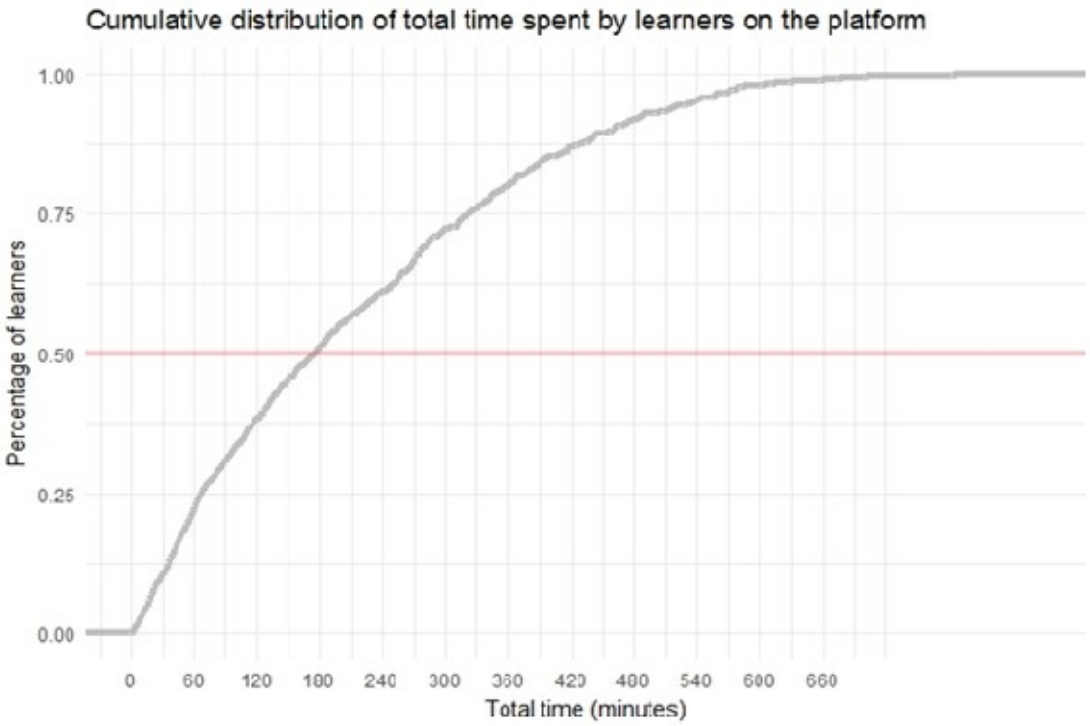
- ≈ 6,000 people joined the course starting in January 2017
- ≈ 3,000 learners connected to the platform at some point
- ≈ 2,000 were active (they completed at least one step in any week)
- ≈ 900 were social learners (they posted at least one comment) and posted altogether ≥ 5,000 comments
- 521 learners (16.7% of learners) completed at least 50% of the steps
- 283 learners completed 90% of the steps

Learner paths and learner trajectories

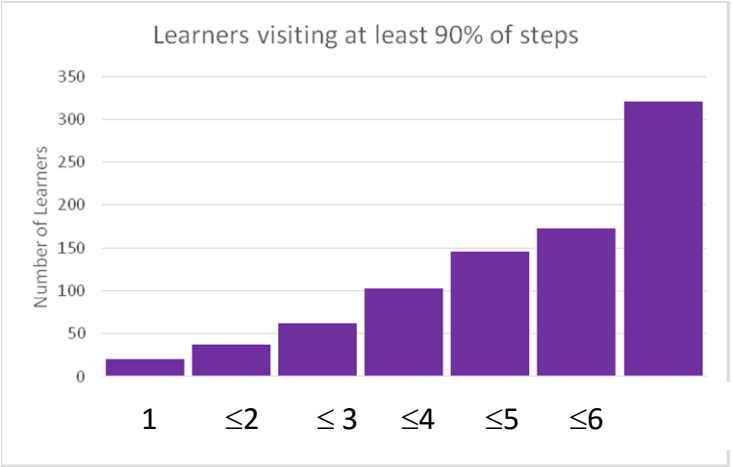
- Learners are expected to follow the linear path and timing
  - In order to follow the “logical” path of learning that the designers have chosen
  - In order to engage in conversations with tutors and peers and learn through them
  - Don’t they?

- Two dimensions
  - Path followed (in the resource space)
  - Speed at which individuals travel along this path (time devoted to resources)
  - Together they form the trajectory: where do you go and how fast?

How fast are learners?

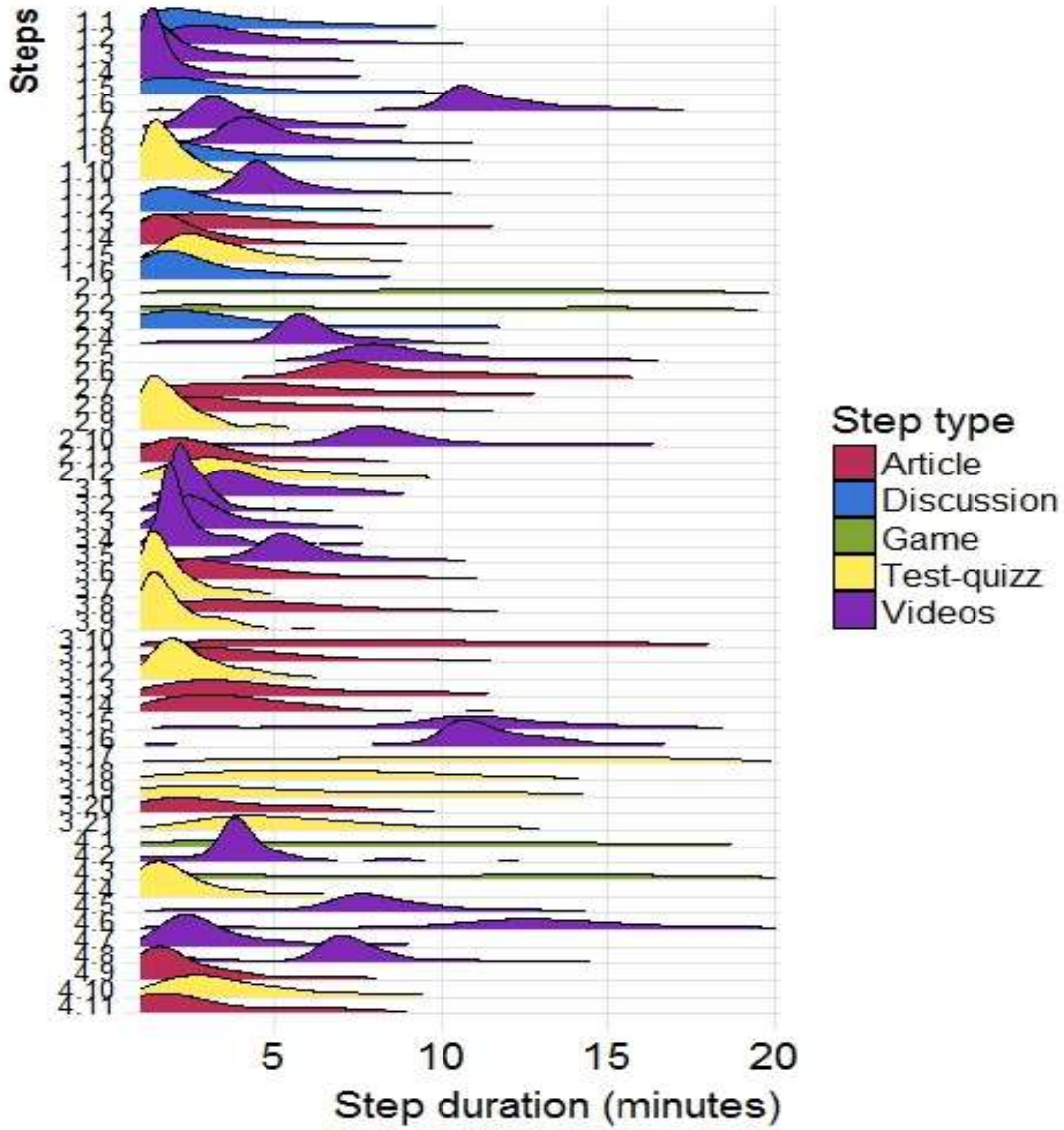


How long does it take people to visit or complete all the 60 steps (or 54 steps, 90% of the course)?



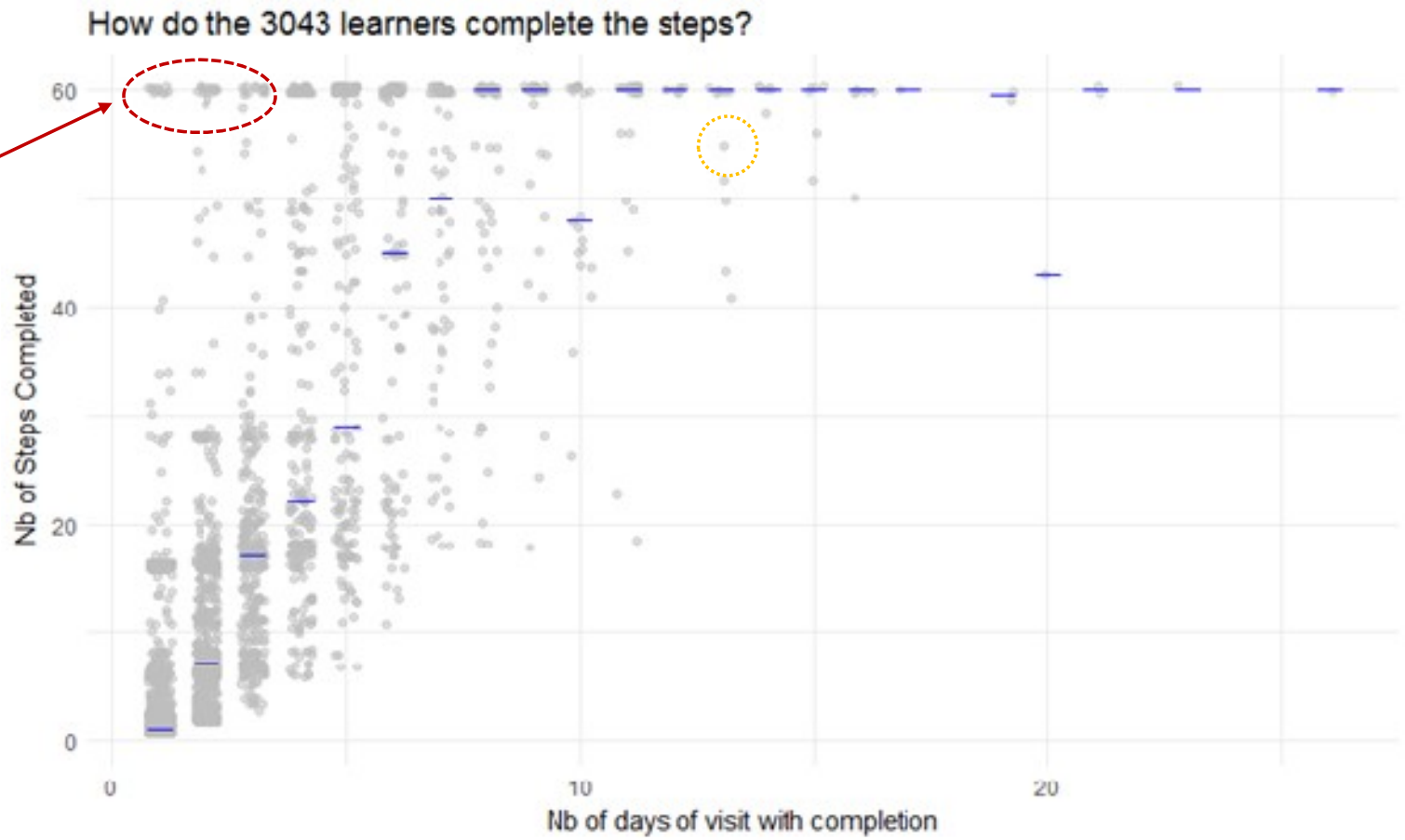
Step duration

- Heterogeneity among resources
  - Games take longer
  - Quizzes are short (except assignments)
  - Some videos take longer: they are longer (interviews)
- Heterogeneity among learners
  - Very visible in games, assignment, discussions, articles
  - Less visible in videos

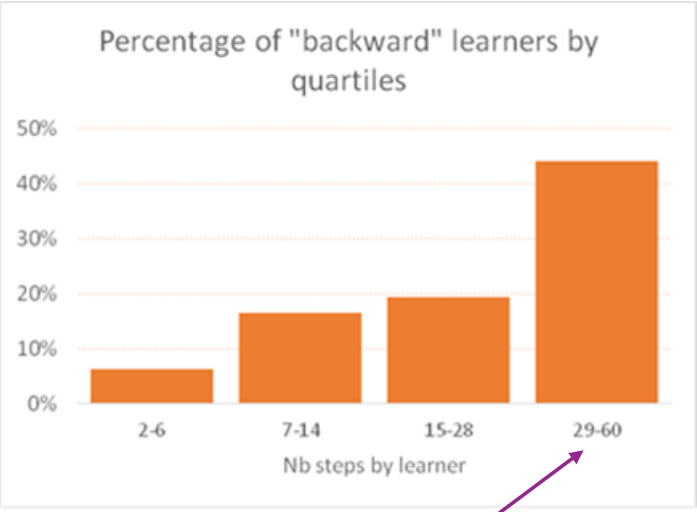


Faster or slower?

Fast learners!
More than one week
in one day

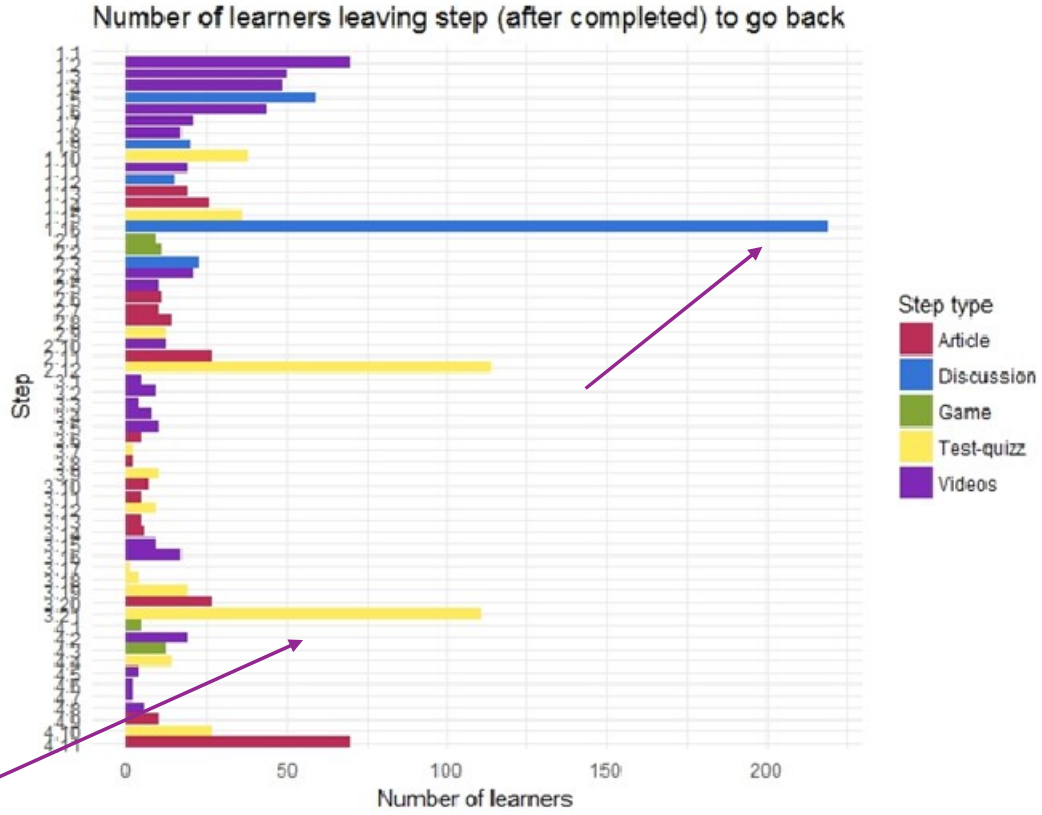


Forward or backward?



Among commited learners, nearly half go backwards (sometimes).

Some steps make learners go back (tests: unsurprisingly, but not only).



Conclusions

- Many learners seem to progress in a non-linear way
  - Davis et al (2016) find that some learners deviate considerably from the designed path
  - Guo and Reinecke (2014) find that MOOC learners seem to progress in a non-linear "exploratory" manner, frequently performing backjumps to review videos
- Timing also differs widely among learners
  - This question of timing has not yet been studied very much
- We think that the understanding of learners' interaction with MOOCs is a crucial issue for the design of courses
  - *"The order of activities is important for capturing a user's learning strategies"* (Wen and Rosé, 2014)

Implications and future research

- Design of MOOCs has to take into account heterogeneity of behaviour
  - By presenting students with diverse options? (follow course in a linear fashion or use differentiated paths like “fast tracks” or “shortcuts”?)
  - Options would need to be incorporated at the design stage
- Monitoring of MOOC sessions must account for diversity of speed
  - For example, monitoring only first week resources during first week may miss the point, since some students are already studying week 4.
- Future research
  - Confirm these ideas on other FutureLearn economic and business MOOCs
  - Study the relationship between path/trajectory and success at tests
  - Study the relationship between path/trajectory and social activity