The HPI MOOC Platform
openHPI – Digital Literacy for Lifelong Learners

- Since 2012
- 770,000+ enrollments
- Free courses by HPI professors, staff and students
- About digital technologies, transformation and innovation

https://open.hpi.de/
openSAP: Learner Behavior and Activity in Self-Paced Enterprise MOOCs

Tobias Rohloff

Chart 3
The HPI MOOC Platform
openSAP – SAP’s Free Learning Platform

- Project partner since 2013
- Free trainings for professionals and customers

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https://open.sap.com/
The openSAP University

openSAP Enterprise MOOCs leverage tried and trusted classroom concepts, including gamification, and discussion forums to interact with peers and experts, in an online delivery format.

Enterprise MOOCs

Podcasts
To complement openSAP MOOCs, we now offer podcasts to give you maximum flexibility to learn at your convenience. Subscribe and to stay up-to-date on relevant topics.

Microlearning
With microlearning on openSAP, you can learn with self-contained, bite-sized content to get a flavor of a topic or simply to complement your existing knowledge.

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Chart 5

4.3+ million
Course Enrollments

~ 200
Course Titles

200+
Countries

1+ million
Unique Learners
openSAP Enterprise and Corporate MOOCs

- **Corporate MOOCs**: limited to employees, custom-built inhouse content
- **Enterprise MOOCs**: free relevant corporate knowledge for stakeholders
- Main topics: technology, software, business, design, or corporate social responsibility
- Fixed start and end date, registration period of several weeks in advance
- **New content** is released on a **weekly** basis
- Average learning effort per **week** is **4-6 hours**
- When a course ends it switches to **self-paced** mode
  - **Content remains available**
  - Graded assignments are not accessible anymore (**no graded certificate**)
  - **Forum is closed** (read-only)
- Possibility to **reactivate** graded quizzes for eight weeks (**fee required**)
Course Structure

Video Lectures

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Chart 7
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Chart 8
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Chart 9
Course Structure

(Team) Peer Assessments

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Chart 10
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Chart 11
Course Structure

Collab Spaces

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Chart 12
Course Structure

Weekly Graded Assignment

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Chart 13
Course Structure
Final Exam

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Chart 14
Certificates

- **Confirmation of Participation (CoP):**
  - Accessing at least 50% of the overall course content

- **Record of Achievement (RoA):**
  - Gaining at least 50% of the overall graded points

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Chart 15
MOOCs are around for almost a decade

The **catalog** of archived or **self-paced courses continuously grows**
- More than 180 self-paced courses on openSAP

**Professionals** are interested in the **content** itself
- Even after a course has ended
- Relevant to their job performance
- Not necessarily interested in receiving a certificate

Professionals often have tight business schedules and workloads
- Conflicts with the weekly schedule of a MOOC

Consumption of content in self-paced mode becomes even more relevant
- On openSAP **30% of all enrollments in self-paced courses**
Typical disadvantages of MOOCs:
- Participants do not show up during the course
- Dropouts resulting in low completion rates

Most research is limited to different aspects tied to the runtime of MOOCs

Due to the lack of existing research in the field of self-paced MOOCs and the relevance for professional learning, we examined the following research question:

How does the learning behavior differ between students in MOOCs who participate during the course and afterward in self-paced mode?
We observed and analyzed the learning behavior of students which highly depends on their goals and intentions.

To reduce the intention-behavior bias we assigned students based on their learning outcome (achieved certificates) to different cohorts.

This is the only indication about their motivation for enrollment.

Assumption: students who achieved the same certificate had a similar motivation to work on the course content.

Limitation: excludes students who had a similar initial motivation but then did not achieve their learning objective.
Sample Courses

- We selected **six courses** for the analysis
- Targeted technical and business professionals
- All courses were held in English in 2017 or 2018
- **Self-paced data** for **2-3 years** at the time of the analysis
- **Free of charge** during their runtime
- Both certificates and all material is freely available since then
- A **charge** is only required for the **reactivation** of the Record of Achievement after the courses had ended
- Two 2-weeks courses were graded by a single final exam
- Two 4-weeks courses and two 6-weeks courses were graded with weekly assignments and a final exam

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Chart 19
Sample Courses (cont.)

- SAP Cloud Platform Essentials (cp1-2)
- Getting Started with Data Science (ds1)
- Find Your Path to SAP S/4HANA (s4h5)
- Introduction to SAP HANA Administration (hsha1)
- SAP Solution Manager for SAP S/4HANA Implementation in a Nutshell (solman1)
- Understanding SAP Fiori Launchpad (fiops1)

| Course     | Weeks | Enrollments |          | Shows |          |
|------------|-------|-------------|----------|-------|----------|
|            |       | At Start    | At Middle | At End | Current  |
|            |       |             |          |       | At Middle |
|            |       |             |          |       | At End    |
|            |       |             |          |       | Current   |
| cp1-2      | 6     | 15203       | 18938    | 21287 | 35082    |
|            |       |             |          |       | 9782     |
|            |       |             |          |       | 12441    |
|            |       |             |          |       | 25060    |
| ds1        | 6     | 11083       | 14407    | 17593 | 33757    |
|            |       |             |          |       | 8527     |
|            |       |             |          |       | 11517    |
|            |       |             |          |       | 24043    |
| s4h5       | 4     | 16075       | 19999    | 22743 | 37657    |
|            |       |             |          |       | 1114     |
|            |       |             |          |       | 14231    |
|            |       |             |          |       | 26222    |
| hsha1      | 4     | 15412       | 18134    | 20219 | 35517    |
|            |       |             |          |       | 9328     |
|            |       |             |          |       | 11968    |
|            |       |             |          |       | 25159    |
| solman1    | 2     | 10739       | 13116    | 15076 | 25970    |
|            |       |             |          |       | 5916     |
|            |       |             |          |       | 8568     |
|            |       |             |          |       | 17288    |
| fiops1     | 2     | 18127       | 21573    | 24228 | 38404    |
|            |       |             |          |       | 10053    |
|            |       |             |          |       | 13603    |
|            |       |             |          |       | 25832    |
| total      | -     | 86639       | 106167   | 121146| 206387   |
|            |       |             |          |       | 54720    |
|            |       |             |          |       | 72328    |
|            |       |             |          |       | 143604   |

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Chart 20
We split the students into two mutually exclusive categories:

1. Students who received a Confirmation of Participation
2. Students who received a Record of Achievement

For both, we assigned the students into cohorts:

- Students who achieved the certificate during the course (guided)
- Students who achieved the certificate after the course (self-paced)

### Course Student Cohorts

| Course | Students with CoP | Students with RoA |
|--------|-------------------|-------------------|
|        | Guided (1.a) | Self-Paced (1.b) | Guided (2.a) | Self-Paced (2.b) |
| cp1-2  | 1143              | 1448              | 2026          | 77               |
| ds1    | 806               | 999               | 2276          | 102              |
| s4h5   | 1569              | 2304              | 4275          | 57               |
| hsha1  | 1438              | 1966              | 3433          | 153              |
| solman1| 1475              | 3995              | 4478          | 85               |
| fiops1 | 2557              | 2764              | 3444          | 32               |
Learning Behavior Metrics

1. The percentage of unique visited learning items
2. The average session duration in seconds
3. The total session duration in seconds
4. The quiz performance in percent
   a. The self-test quiz performance for students with a CoP
   b. The total quiz performance for students with a RoA
5. The percentage of unique played videos
6. The percentage of unique downloaded videos
7. The percentage of unique downloaded slides
8. The passive forum activity (visits and subscriptions) per day
   □ Based on the user’s first and last activity in a course
Analysis

Methods:

- Mann-Whitney U test to calculate statistically significant differences
- Cohen’s $d$ to measure effect sizes
- Descriptive statistics to assess practical relevance

Guided vs. Self-Paced Students with CoP (1.a vs 1.b)

Guided vs. Self-Paced Students with RoA (2.a vs 2.b)

2 groups * 8 metrics * 6 courses = 96 assessed $p$-values and effect sizes ($d$)
Results
Guided vs. Self-Paced Students with CoP

- **Visited items**: highly statistically significant differences in 4 courses with small effect sizes in 2 courses
  - Mean values show no practical relevance
  - Contradicts the initial premises of fewer item discovery from self-paced learners
  - Overall item discovery confirms a lack of consumption, either selective or linear

- **Average and total session durations**: highly statistically significant differences in almost all courses with small to large effect sizes
  - Self-paced students have longer sessions on but a shorter total learning time
  - Self-paced students learned more time-efficient and with fewer interruptions
  - All content is already available in self-paced mode, there is no need to wait
  - Makes fewer and therefore more extended learning sessions possible
Results
Guided vs. Self-Paced Students with CoP (cont.)

- **Self-test quiz performance**: statistically significant differences in all courses with small effect sizes in 4 courses
  - Guided learners perform slightly better
  - We see no practical relevance here
  - Assumption: learners are more engaged by focusing on the weekly content available during the runtime rather than rushing through the course in self-paced mode and thus performing better in quizzes

- **Played videos, downloaded videos, downloaded slides, and passive forum activity**: a lot of statistical significance and effect sizes
  - But no clear practical relevant differences
  - Large sample sizes lead quickly to significant results
Results
Guided vs. Self-Paced Students with RoA

- **Visited items**: statistically significant differences in 3 courses with small effect sizes in 2 of them
  - On average, self-paced learners visit more items
  - But no practical relevance
  - Assumption: paying users are more engaged with the content compared to participants during the free of charge runtime

- **Average session durations**: highly statistical differences in all six courses with high effect sizes
  - Self-paced students also have much higher average session durations
  - Confirms results from the CoP cohorts comparison and lead to same interpretation
  - Practical relevance
Results
Guided vs. Self-Paced Students with RoA (cont.)

- **Total session duration:** only highly statistical differences in 2 courses with small effect sizes
  - Self-paced students stay much longer on the platform in total
  - Practical relevance
  - Contradicts findings from the CoP comparison where the total session duration of self-paced learners decreased
  - Can also be attributed to perceived higher value of the for-fee RoA which leads to an increase in learning time

- **Quiz performance:** statistically significant differences in 3 courses and small effect sizes in 2 courses
  - Self-paced students perform slightly better in quizzes on average
  - No practical relevance
Results
Guided vs. Self-Paced Students with RoA (cont.)

- **Played videos:** 2 courses showed statistically significant differences
  - But we consider 5 of the 6 courses as practical relevant
  - Self-paced students watched more video lectures

- **Downloaded videos:** statistically significant differences in 3 courses
  - Self-paced learners downloaded notably more videos

- **Downloaded slides:** statistically significant differences in 2 courses
  - Self-paced learners downloaded more slides
  - Learners who reactivated courses for a fee show higher rates of engagement for all aspects of the content provided

- **Passive forum activity:** 2 courses showed statistically significant differences
  - Guided students passively used the forum more often
Conclusion

- Self-paced learners with a CoP have longer sessions on average compared to guided learners with a CoP but a shorter total learning time
  - Indicates that they learned more time-efficient and with fewer interruptions
- Self-paced learners with an RoA tend to be more engaged in general, regarding the total and average session duration; and performed slightly better in quizzes, played and downloaded more videos and slides
  - Higher engagement is probably related to the fee charged for reactivating a RoA
  - Only exception is passive forum use which is higher for guided students
- Practical impact needs to be studied in further research
- Consider other aspects: instructional design, structure of the content, domain
- The goal is to better understand our user’s needs to improve the overall learning experience on business MOOC platforms
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