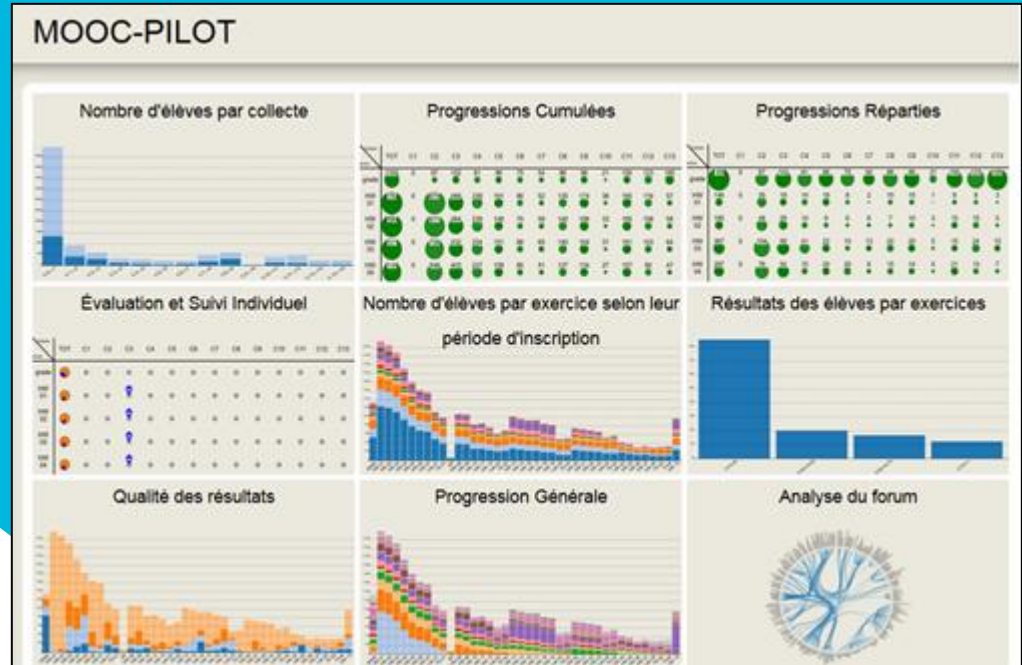


edX Forum Montréal 2018

MOOC-Pilot

MOOC Analytics and Learner Tracking



- **Part of French National Research Project “FLIRT” (2016-2019)**
 - **Innovations to improve teaching efficiency of MOOCs**
- **MOOC-Pilot Directed by Pr. Michel Crampes, Michel Plantié Phd**
Computer Science Professor and Assistant Professor
- **IMT Mines Alès in France, LGI2P research laboratory**
- **Used in 50 MOOCs, on edX and FUN (France Université Numérique)**



MOOC-Pilot goals

- Difficulty in MOOCs to have an efficient Learner data tracking:
 - what to do with more than 10.000 learners?
- Massive data problem :
 - how to handle a great number of grades?
 - how to visualise grades meaningfully?
 - how to visualise learners' progress?

MOOC-Pilot versus edX Insights

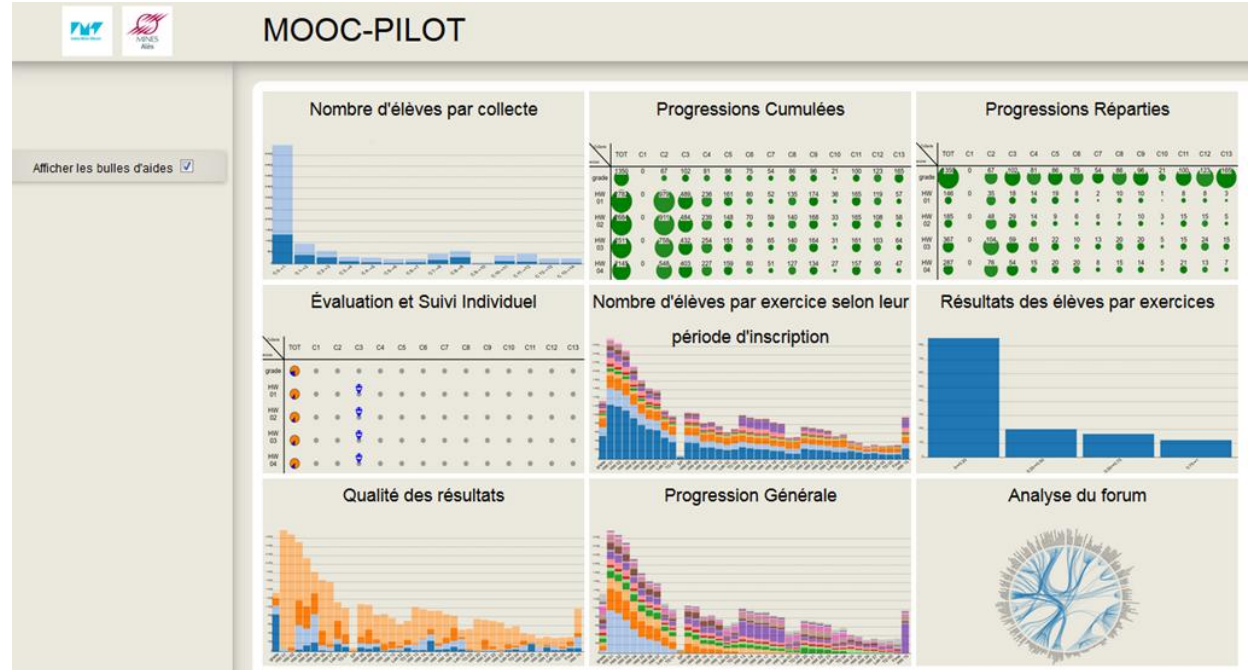
edX Insights: already provides graphic information on MOOC sessions

- Enrolments, locations, performance, grades, engagement, interactions, videos, etc.
- Forum participation for previous MOOC week,
- **MOOC-Pilot provides visually enhanced information**
 - **Global learners' grade progression over time**
 - **time progression based on grades**
 - **forum monitoring over entire course**
 - **Learners data per Cohort**

MOOC-Pilot's DASHBOARD

Frontend

- Visual direct access to several tools (9 and more to come)
- Visual Presentations :
 - ➔ facilitate learners monitoring by the teaching team
 - ➔ before, during and after MOOC session



MOOC-Pilot's DASHBOARD

backend management (teacher access)

- Parametrized automatic data captured on edX and FUN platforms
- Periods of data collections: generally once a week
- Multi-mooc management
- Fully Compatible with any Open edX platform

MOOC-PILOT
Interface Administrateur
MOOC : RL

Actualisation et retour en mode tuteur

Récupération du forum

Récupération des collectes

Désactiver la collecte automatique

Collecte automatique : Active

Collecte hebdomadaire les dimanches.

Prochaine collecte dimanche 14 janvier 2018.

Forcer une collecte manuellement

Liste des collectes chargées à partir de FUN

Actif	Identifiant de collecte	Nom de la collecte	Enregistrer la collecte en local
<input type="checkbox"/>	C1 (manu)	univ-toulouse_101008_session01_grade_report_2017-10-10-1345.csv	<input type="button" value="Enregistrer en local"/>
<input type="checkbox"/>	C2 (manu)	univ-toulouse_101008_session01_grade_report_2018-01-09-1044.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C3 (manu)	univ-toulouse_101008_session01_grade_report_2018-01-09-2109.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C4 (auto)	univ-toulouse_101008_session01_grade_report_2018-01-14-2107.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C5 (auto)	univ-toulouse_101008_session01_grade_report_2018-01-21-2107.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C6 (manu)	univ-toulouse_101008_session01_grade_report_2018-01-24-1730.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C7 (auto)	univ-toulouse_101008_session01_grade_report_2018-01-28-2108.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C8 (auto)	univ-toulouse_101008_session01_grade_report_2018-02-04-2108.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C9 (auto)	univ-toulouse_101008_session01_grade_report_2018-02-11-2108.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C10 (auto)	univ-toulouse_101008_session01_grade_report_2018-02-18-2108.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C11 (auto)	univ-toulouse_101008_session01_grade_report_2018-02-25-2108.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C12 (auto)	univ-toulouse_101008_session01_grade_report_2018-03-04-2108.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C13 (auto)	univ-toulouse_101008_session01_grade_report_2018-03-11-2108.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C14 (manu)	univ-toulouse_101008_session01_grade_report_2018-03-22-1357.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C15 (auto)	univ-toulouse_101008_session01_grade_report_2018-03-25-2109.csv	<input type="button" value="Enregistrer en local"/>
<input checked="" type="checkbox"/>	C16 (manu)	univ-toulouse_101008_session01_grade_report_2018-03-26-1003.csv	<input type="button" value="Enregistrer en local"/>

Informations de connexion au cours nécessaires à la collecte automatique

Identifiant de connexion à FUN :

Mot de passe de connexion à FUN :

Cours sur la plateforme EDX

Nom de l'institut du cours

Identifiant du cours

Nom de la session du cours :

Number of learners per period

CHART 1

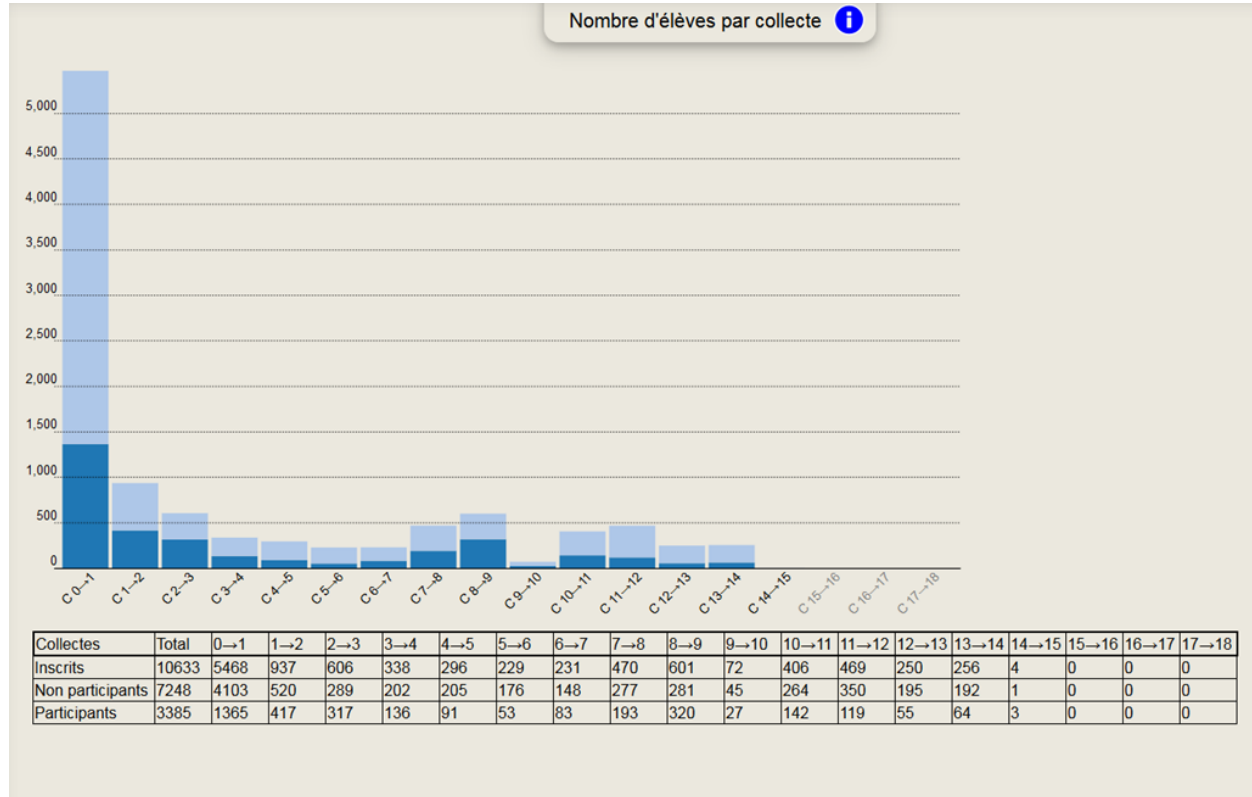
Number of enrolments per period

→ **Participants:** enrolled learners who has started the course

→ **Non-participants:** enrolled learners who did not start the course

Benefits for the teaching team:

→ *shows if learners who enrolled a long time before the course opening were more likely not to start*



Distributed progression – exit points

CHART 3

→ The last exercise completed by learners in each period.

→ Columns are MOOC periods.

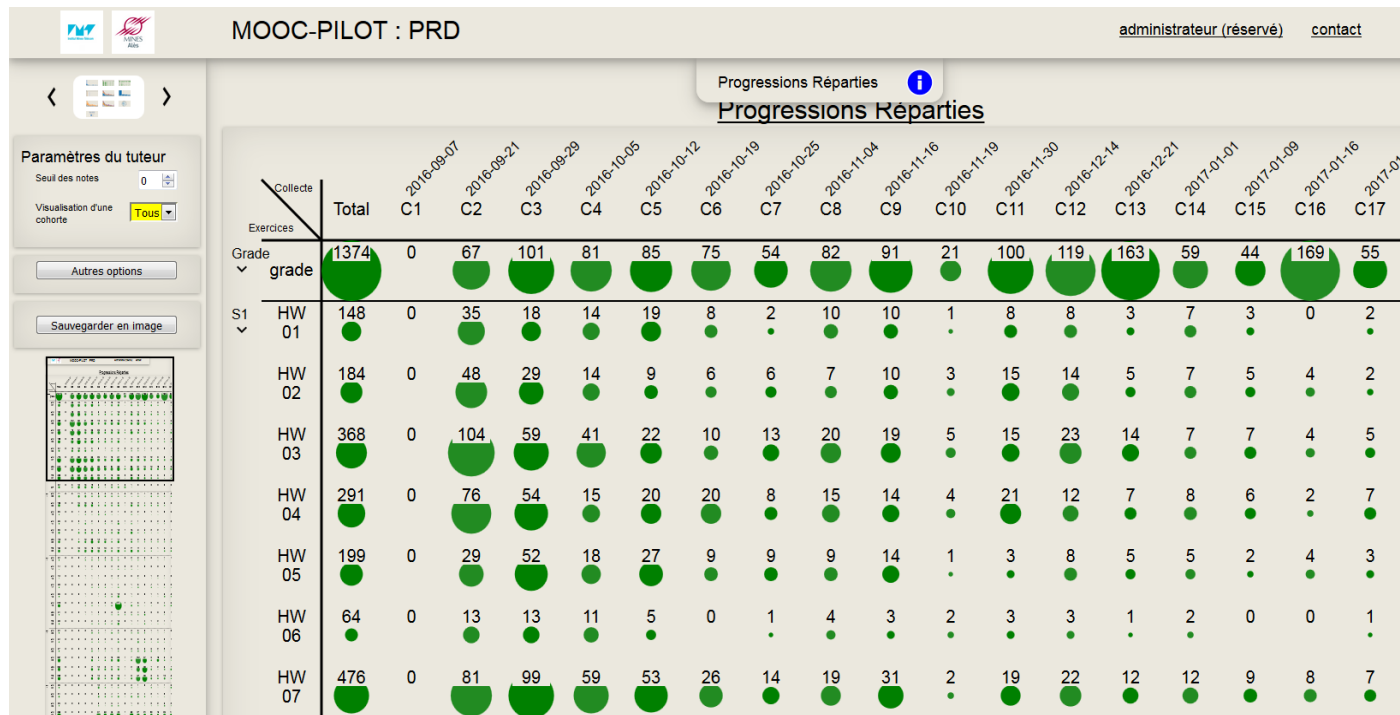
→ Lines are exercises.

→ A bubble contains all learners who completed their last exercise.

→ Each learner is located in only one bubble

→ By Clicking on a bubble: the teaching team can see a list of learners in this bubble.

→ *Benefit: track difficulties*



GROUP progression

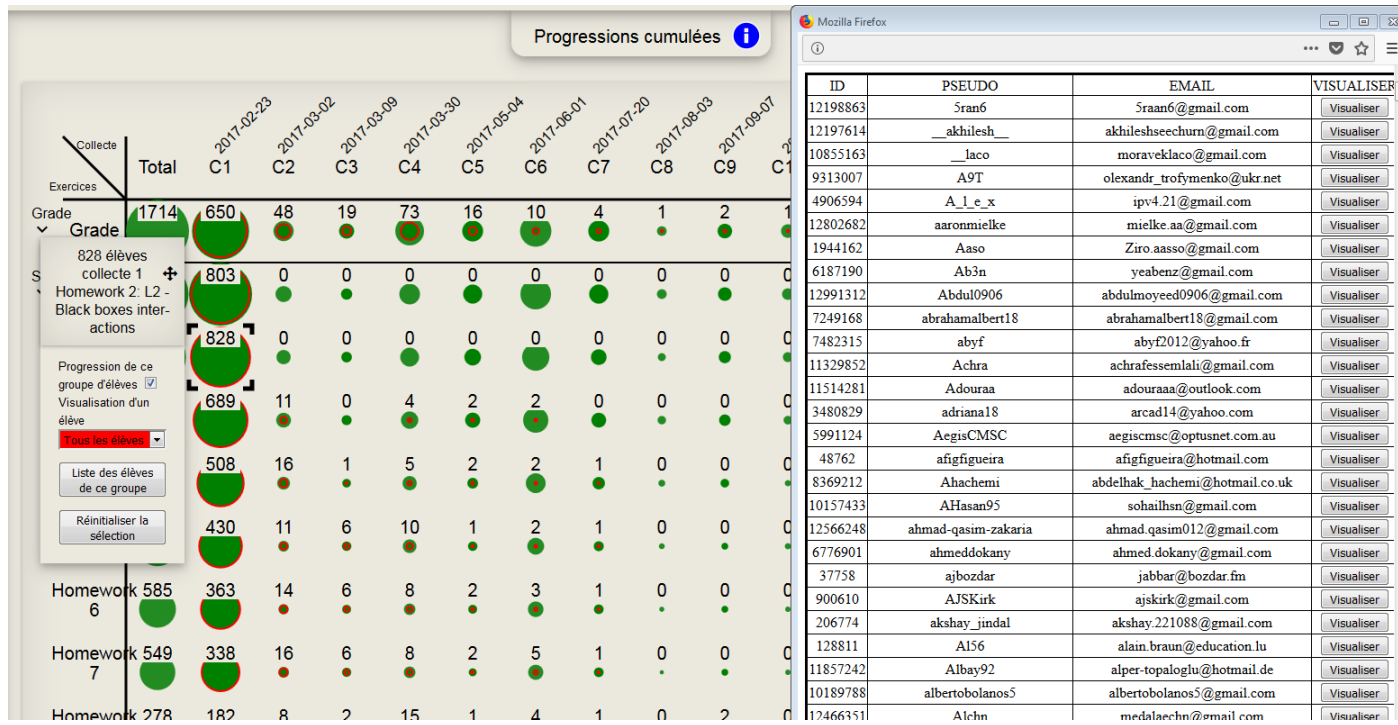
CHART 3

➤ In this graph, learners are present in as many exercises (represented by bubbles) as they participated in

➤ ➔ By clicking on a bubble, the instructors can see the other activities of the learners of the selected bubble (squared) ➔ which bubbles they come from ➔ which bubbles they go to

Click gives also list of learners and their emails

Benefit: Send information to selected learners



COHORT progression

CHART 3

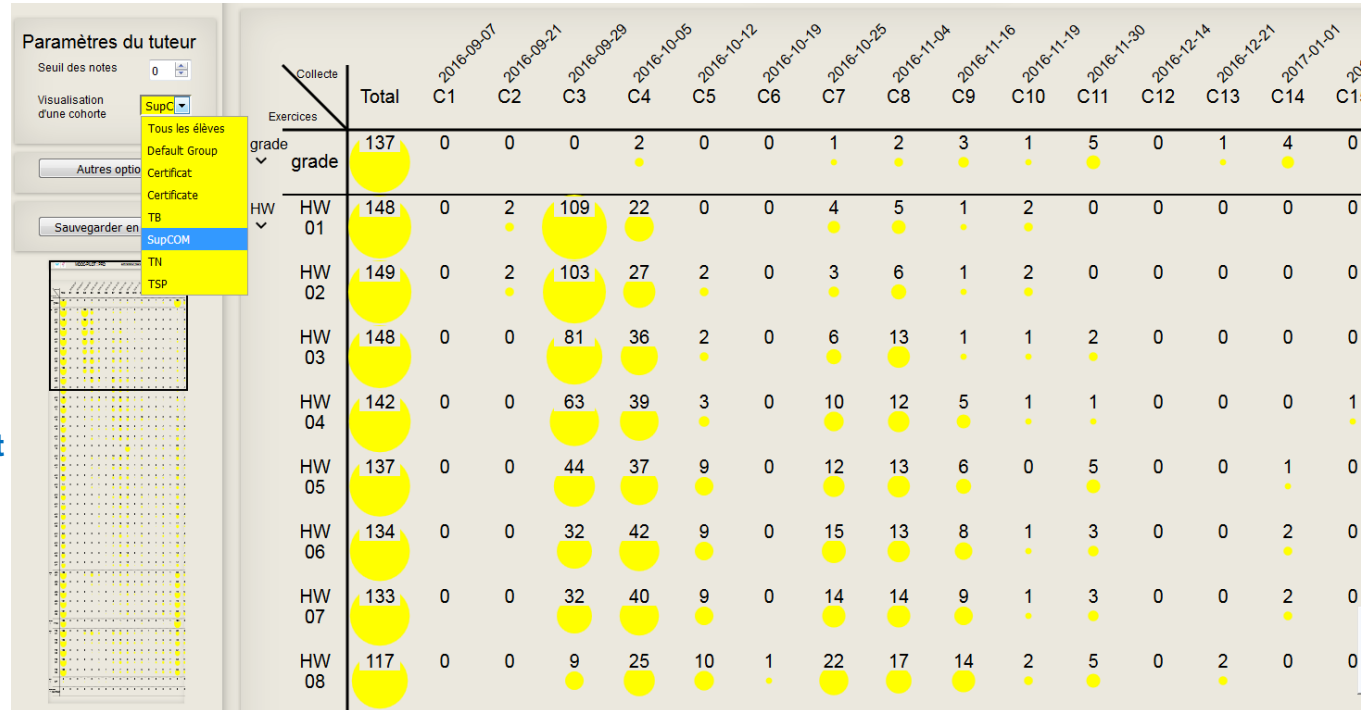
COHORT Visualisation:

→ Same information but limited to each cohort

→ Grade threshold filter

→ Possibility to choose and visualise data for each cohort

Benefit: SPOC monitoring



Individual learner monitoring

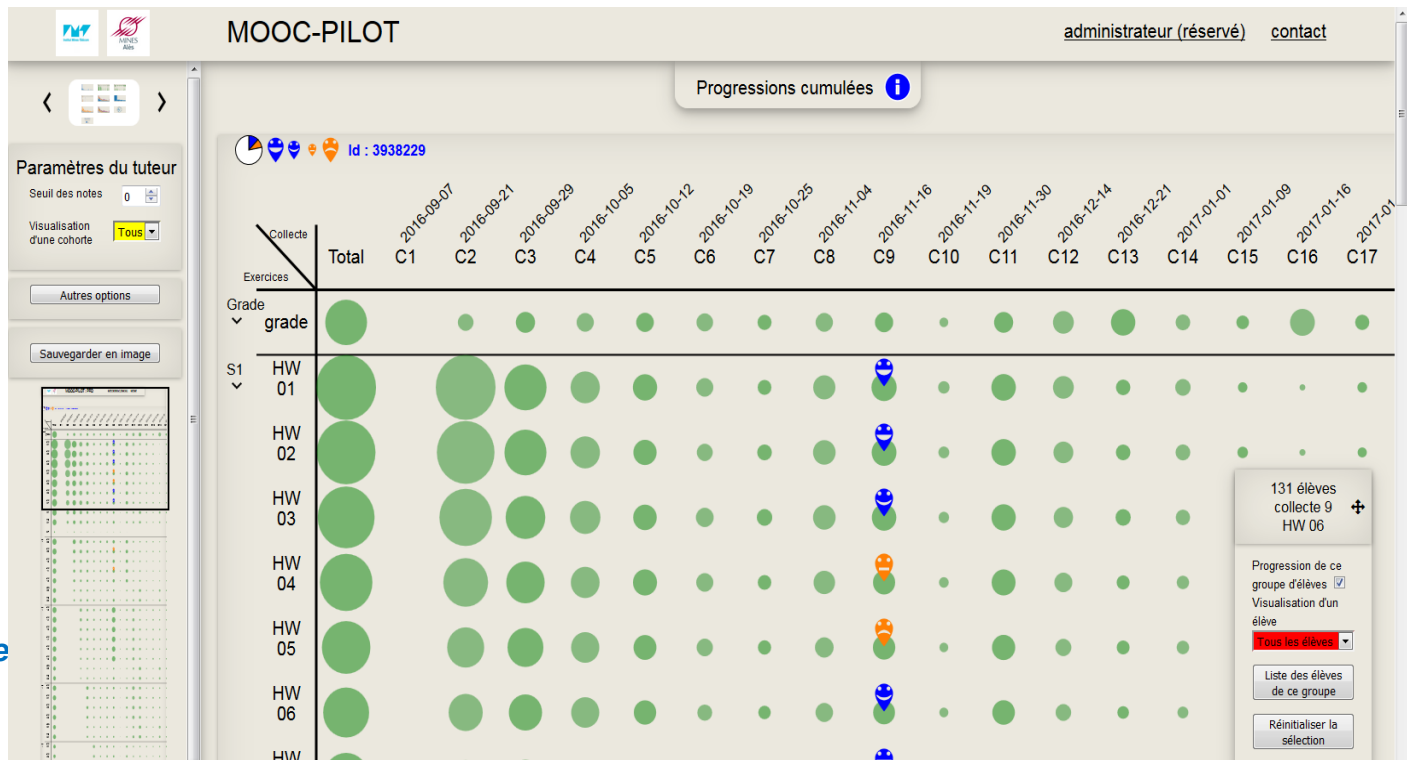
CHART 4

→ Individual learners' progression during the course

→ Emoticons: Learners' performance (quartiles from 0 to 1)

→ Columns: MOOC periods.

Benefit: track each learner individually, which can be useful in SPOCs with individual tutoring



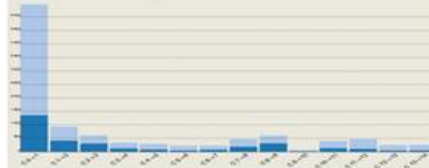
MOOC-Pilot's Statistics



MOOC-PILOT

Afficher les bulles d'aides

Nombre d'élèves par collecte



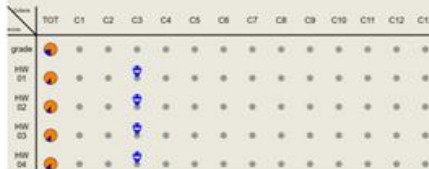
Progressions Cumulées



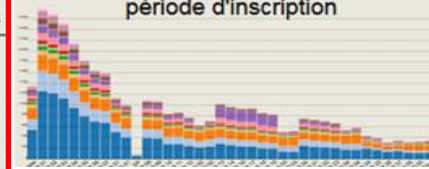
Progressions Réparties



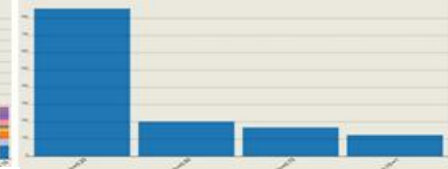
Évaluation et Suivi Individuel



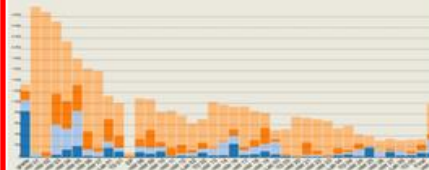
Nombre d'élèves par exercice selon leur période d'inscription



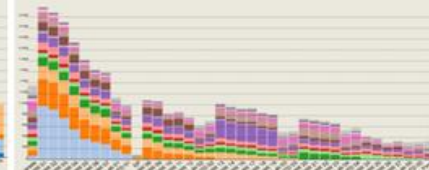
Résultats des élèves par exercices



Qualité des résultats



Progression Générale



Analyse du forum



Learners: General Progression

CHART 8

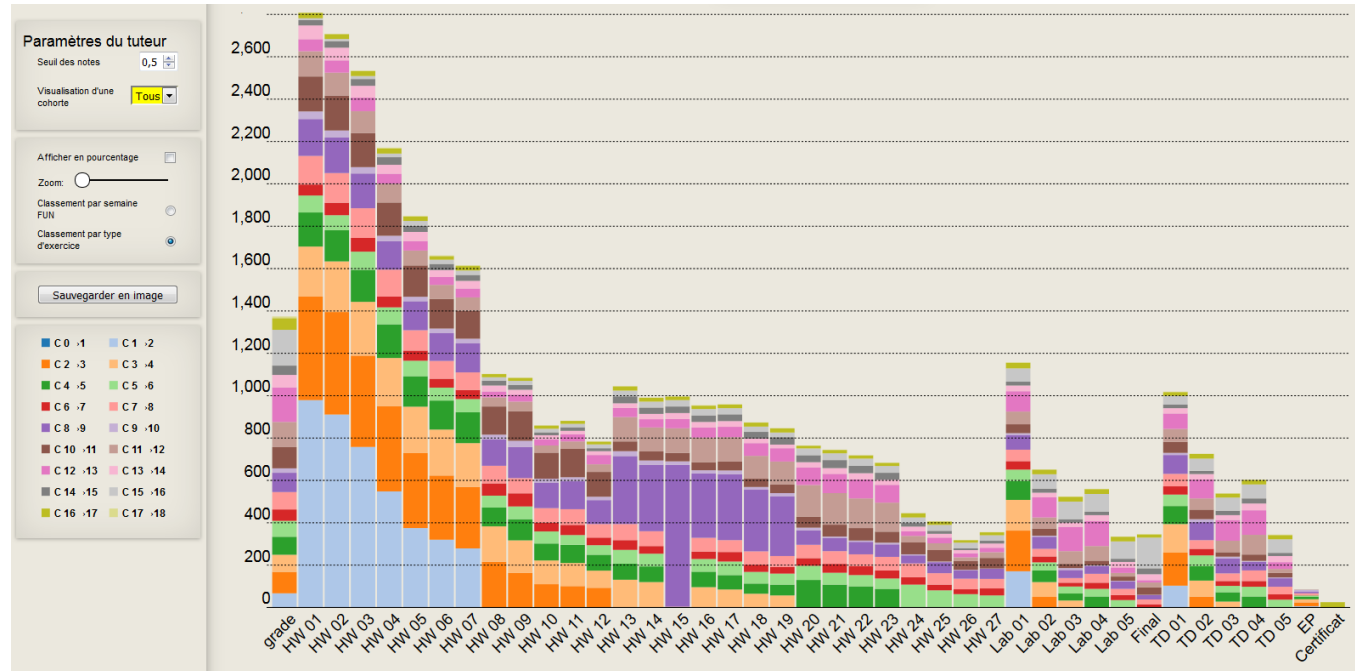
→ Number of learners having completed exercises according to each course period

Each column is an exercise, in which each color represents the number of learners of a period having completed the exercise

Benefit: see learners progression in time

→ 2/3 of learners perform exercises later in the course

General Progression - Bar Chart



Forum Analysis: Hovering over the forum

CHART 9

→ Center: Browse all Exchanges with local fisheye : posts, answers

Upper left side :

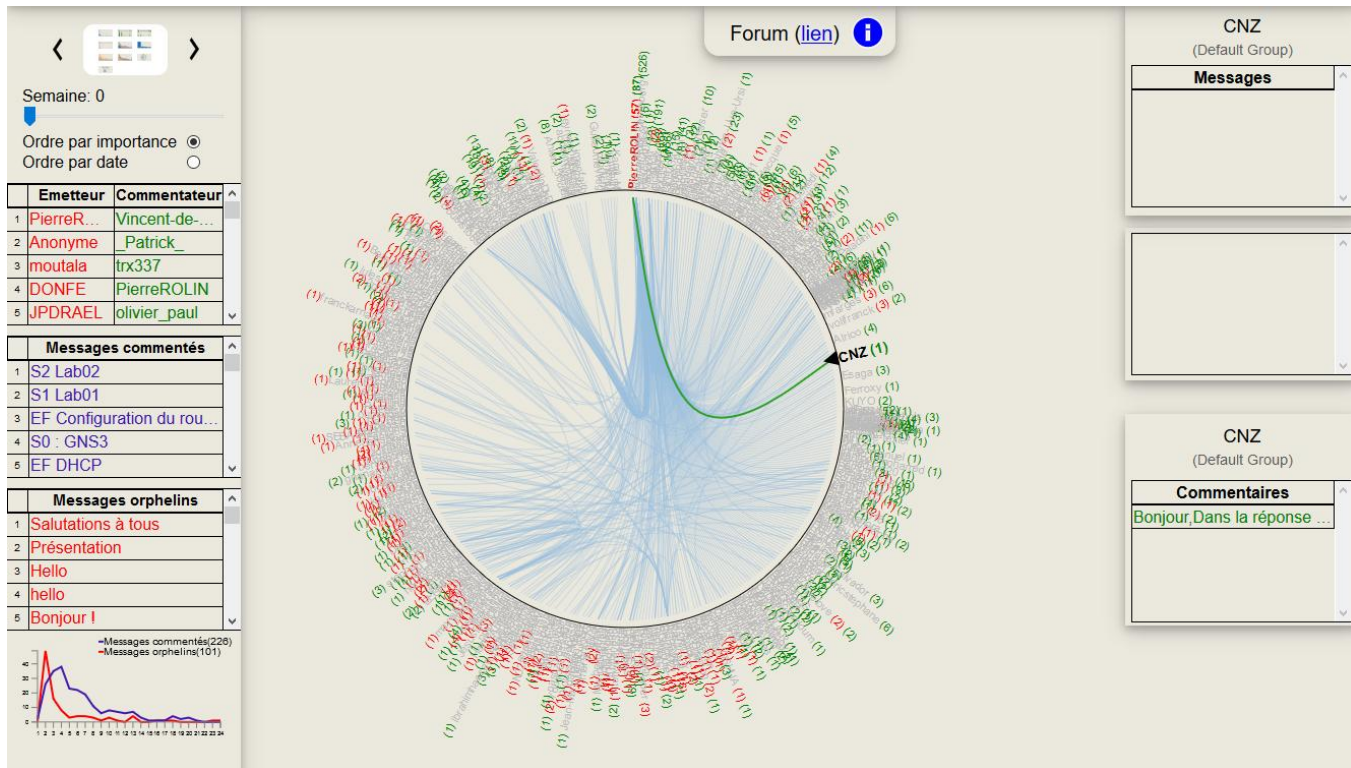
→ Red: ordered senders of messages (posts).

→ Green: ordered answers to messages

→ Messages:

- Commented messages
- Orphan messages (without comments)

→ Bottom left graphics: commented and orphan messages

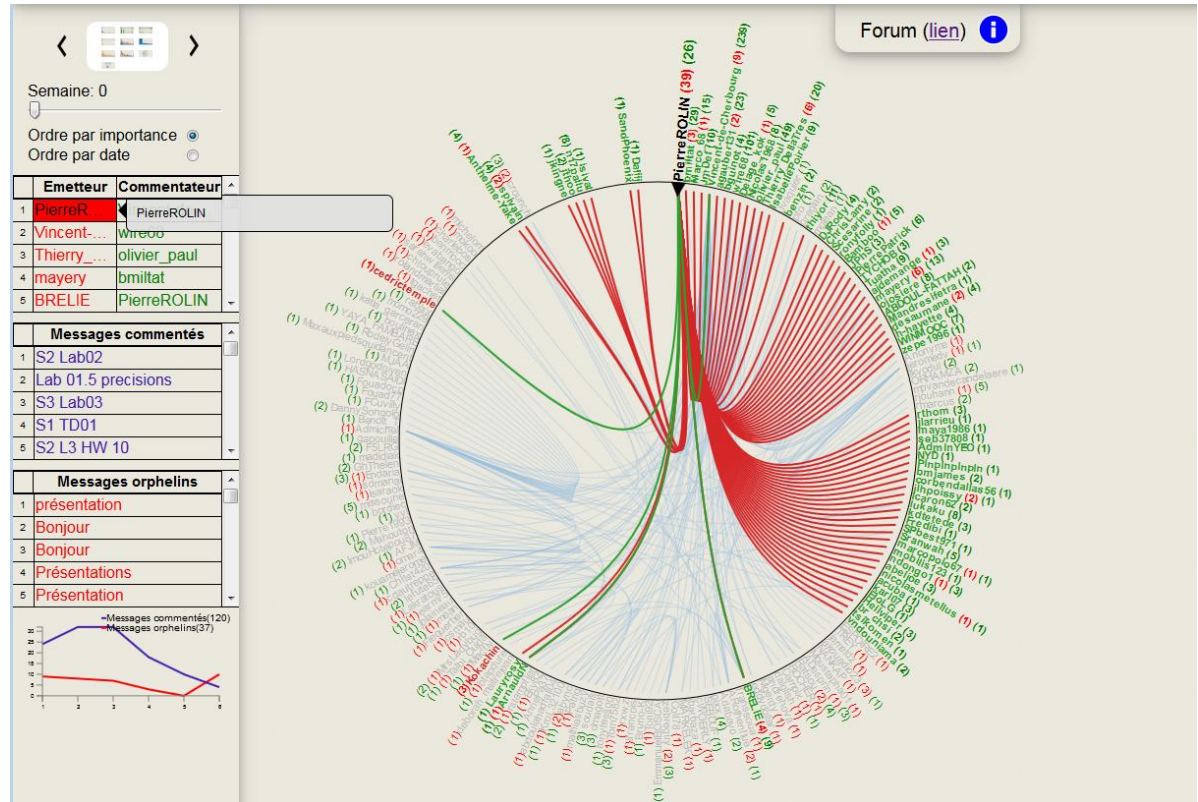


Forum Analysis: zoom on one learner

CHART 9

User (learner or tutor) messages visualisation

→ All exchanges from a specific User



Forum Analysis: zoom on one post

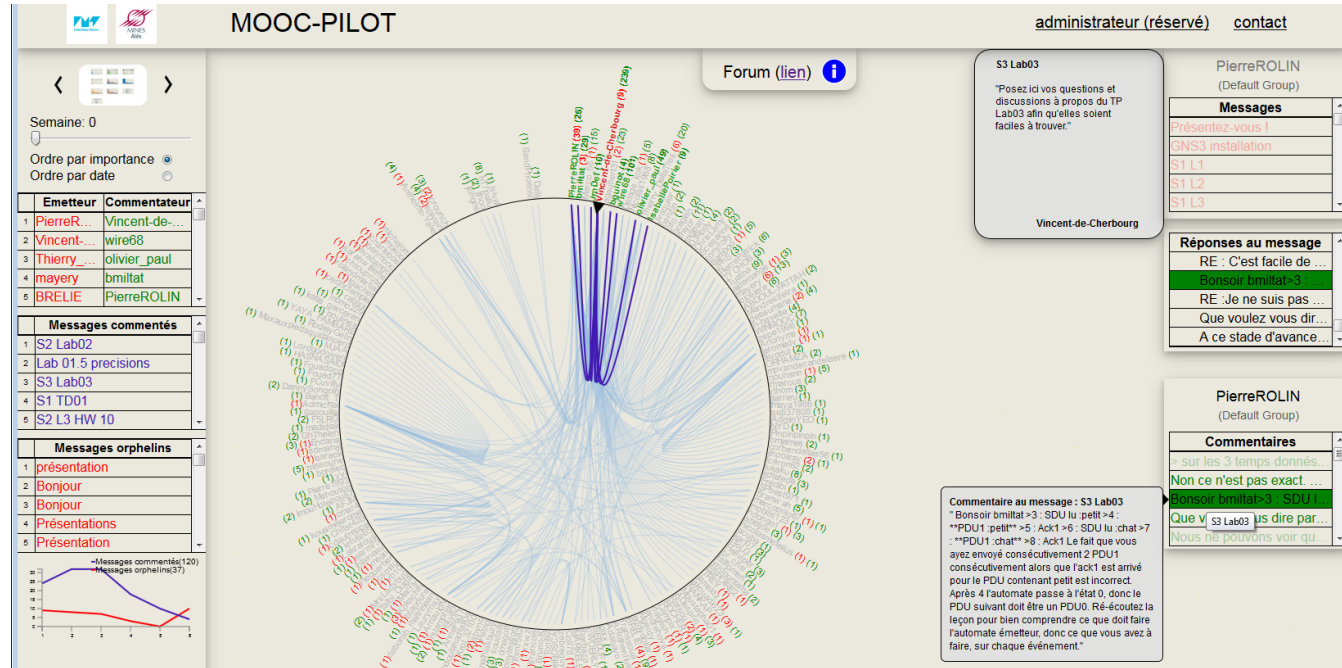
CHART 9

→ By Clicking on a message (upper right) you can see all the answers and comments

Message content and visualisation on the wheel

→ By hovering on a message

Message answer and commentaries



MOOC-Pilot based on:

D3 javascript library

- Client-Server architecture
- Client side : Javascript + HTML
- Server side : Java and Javascript
- Server architecture:
 - LINUX - Debian
 - TOMCAT 7
 - Java
 - no database

Independant from edX

Simply to install on a server: opensource version

New interface design – exit points

CHART 3

→ The last exercise completed by learners in each period.

→ Columns are MOOC periods.

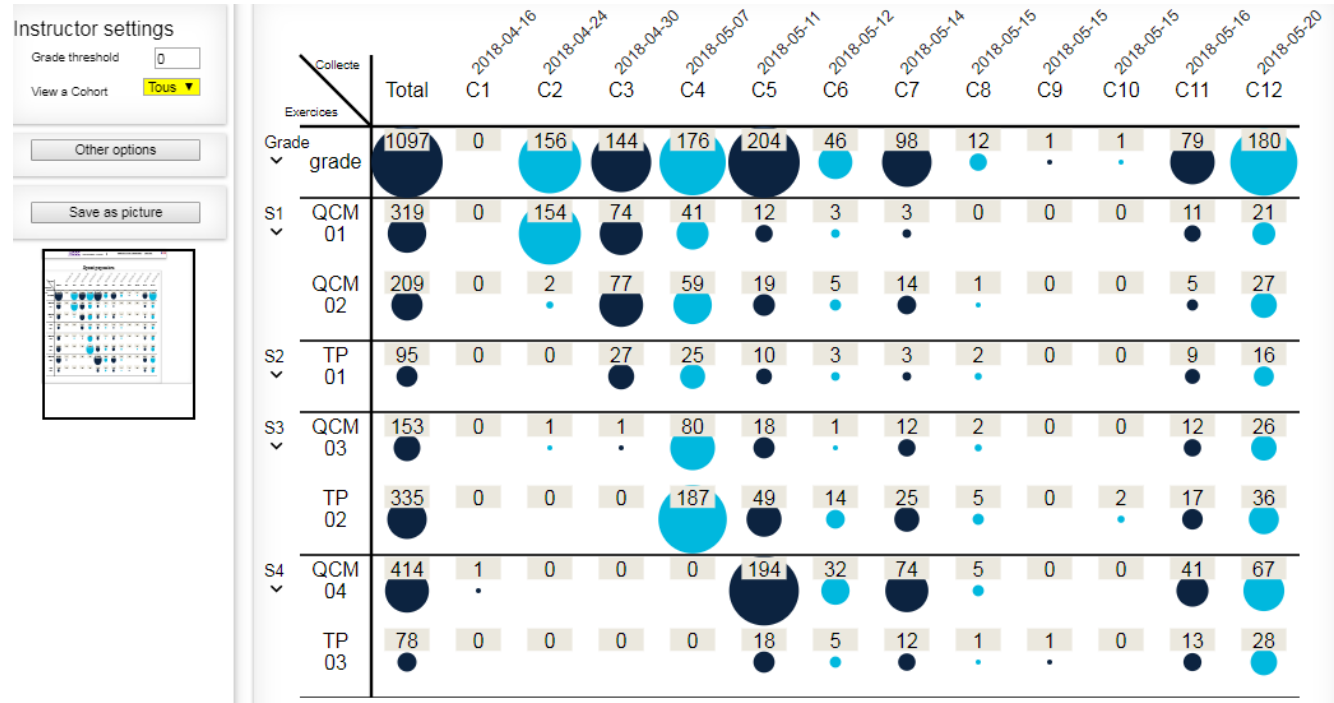
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→ *Benefit: track difficulties*



New interface design – GROUP progression

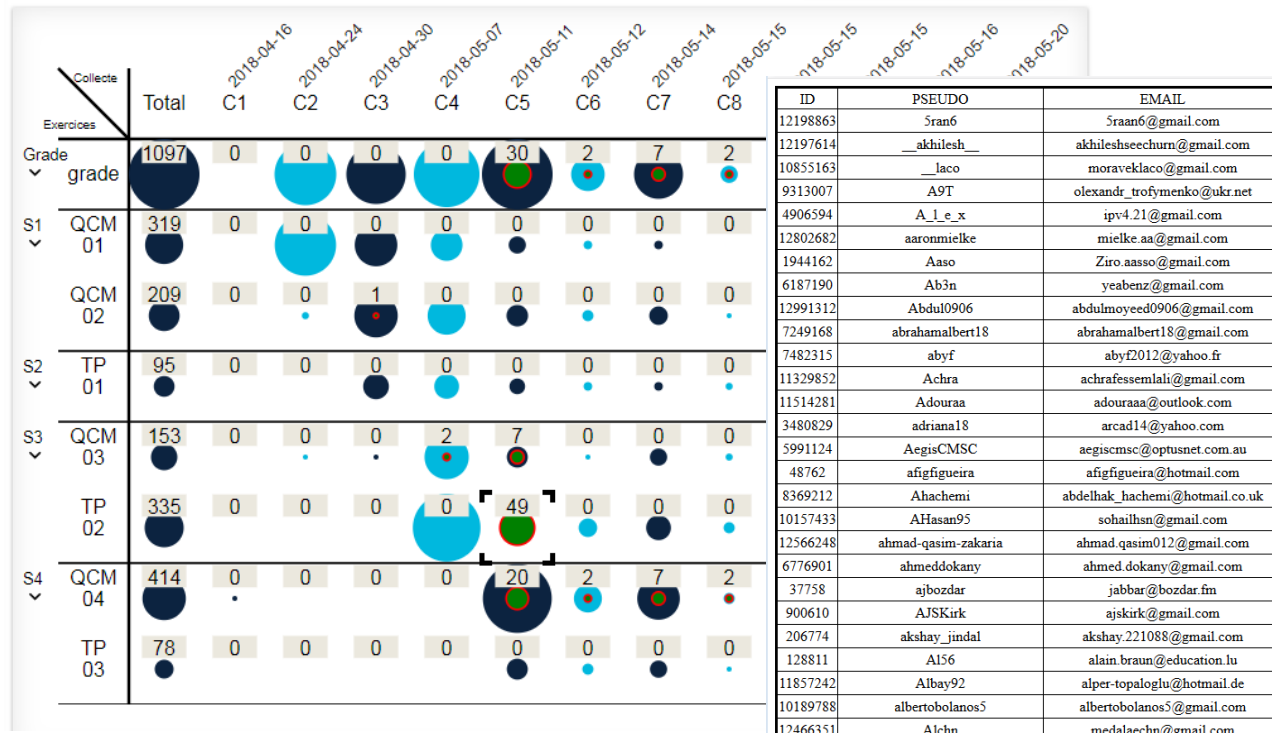
CHART 3

➤ In this graph, learners are present in as many exercises (represented by bubbles) as they participated in

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Click gives also list of learners and their emails

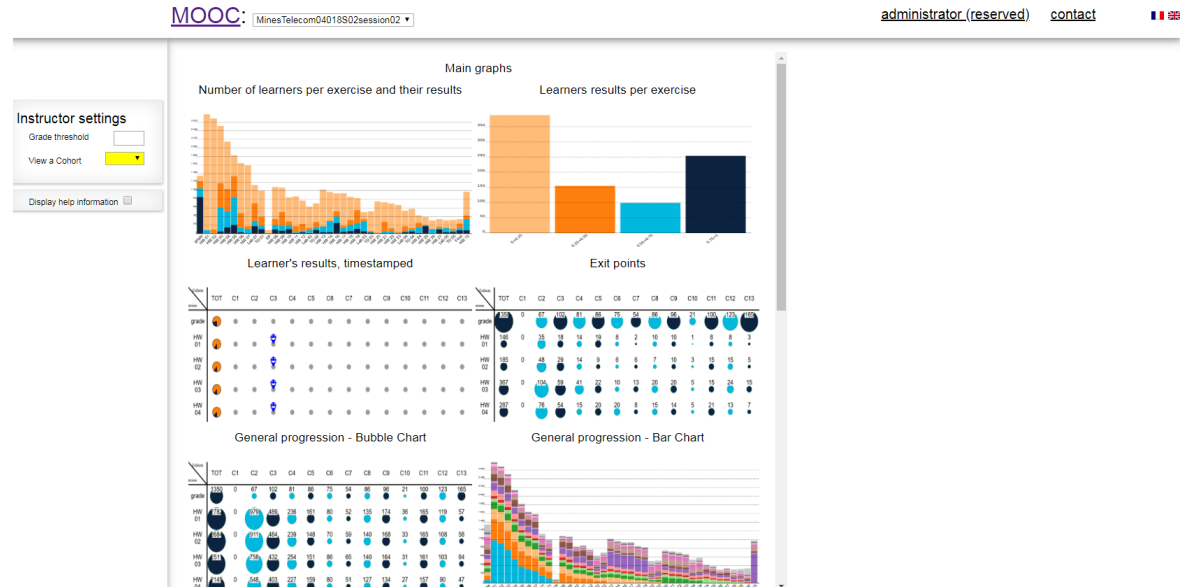
Benefit: Send information to selected learners



New interface design - DASHBOARD

Frontend

- Visual direct access to several tools (9 and more to come)
- Visual Presentations :
 - ➔ facilitate learners monitoring by the teaching team
 - ➔ before, during and after MOOC session



Conclusion

MOOC-Pilot

An efficient tool to help tracking learners

- **9 different ways of tracking**
- **Simplified complex data visualization**
- **Based on grade reports**

- **Much More to do:**
 - **Enhance forum visualization**
 - **Visualization of learner logs**
 - **Visualization of activity, video watching**
 - **Strategic tools for executives**
 - **SPOC specificities**
 - **Etc.**

MOOC-Pilot open usage

- OPEN SOURCE on Github:
<https://github.com/plantie/moocpilot>
- FREE SOFTWARE LICENSING AGREEMENT CeCILL
- Integration in edX ?

MOOC-Pilot information

- www.mooc-pilot.com/PRD
- Email: michel@plantie.fr
- Laurent David (Mooc-Pilot Administration): laurent@call-learning.fr
- Pierre Rolin (FLIRT CEO): pierre.rolin@mines-telecom.fr
- Tel : +33602113240

New interface design - Individual monitoring

CHART 4

→ Individual learners' progression during the course

→ Emoticons: Learners' performance (quartiles from 0 to 1)

→ Columns: MOOC periods.

Benefit: track each learner individually, which can be useful in SPOCs with individual tutoring



New interface design – Forum Analysis

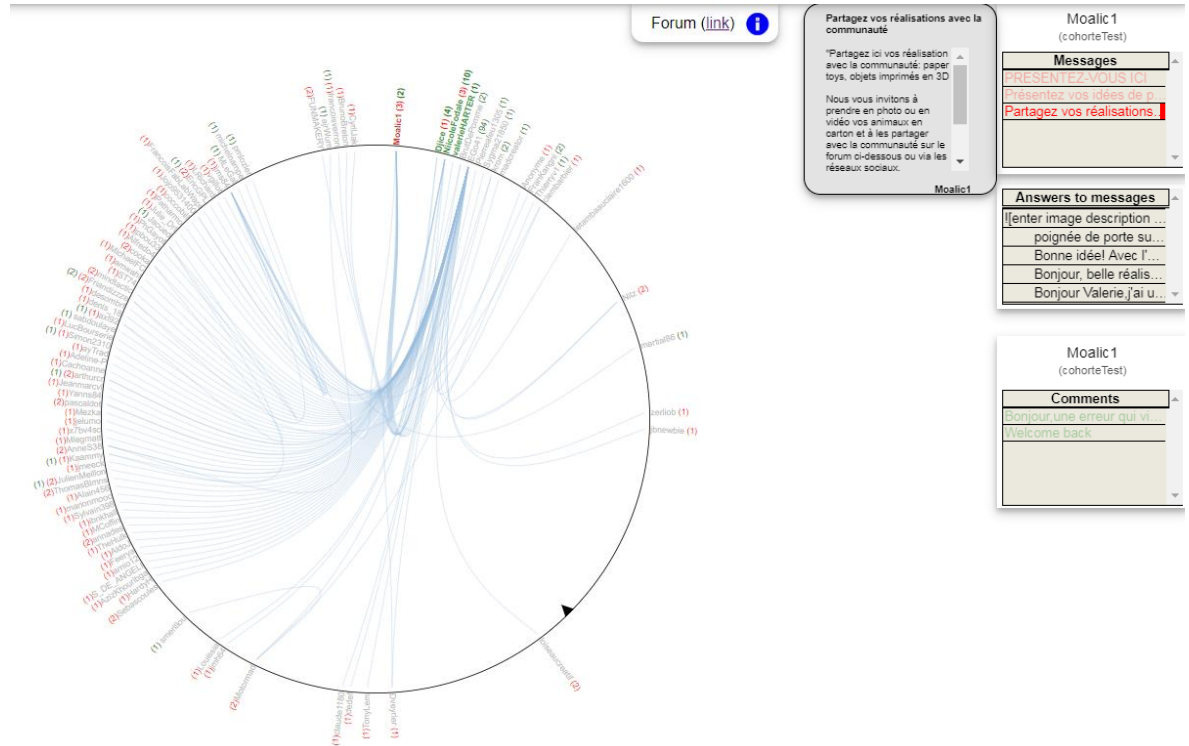
CHART 9

→ By Clicking on a message (upper right) you can see all the answers and comments

Message content and visualisation on the wheel

→ By hovering on a message

Message answer and commentaries



Thank you !

MOOC-Pilot information

- www.mooc-pilot.com/PRD
- Email: michel@plantie.fr
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- Tel : +33602113240

Annexes+

MOOC-Pilot

Result for each exercice

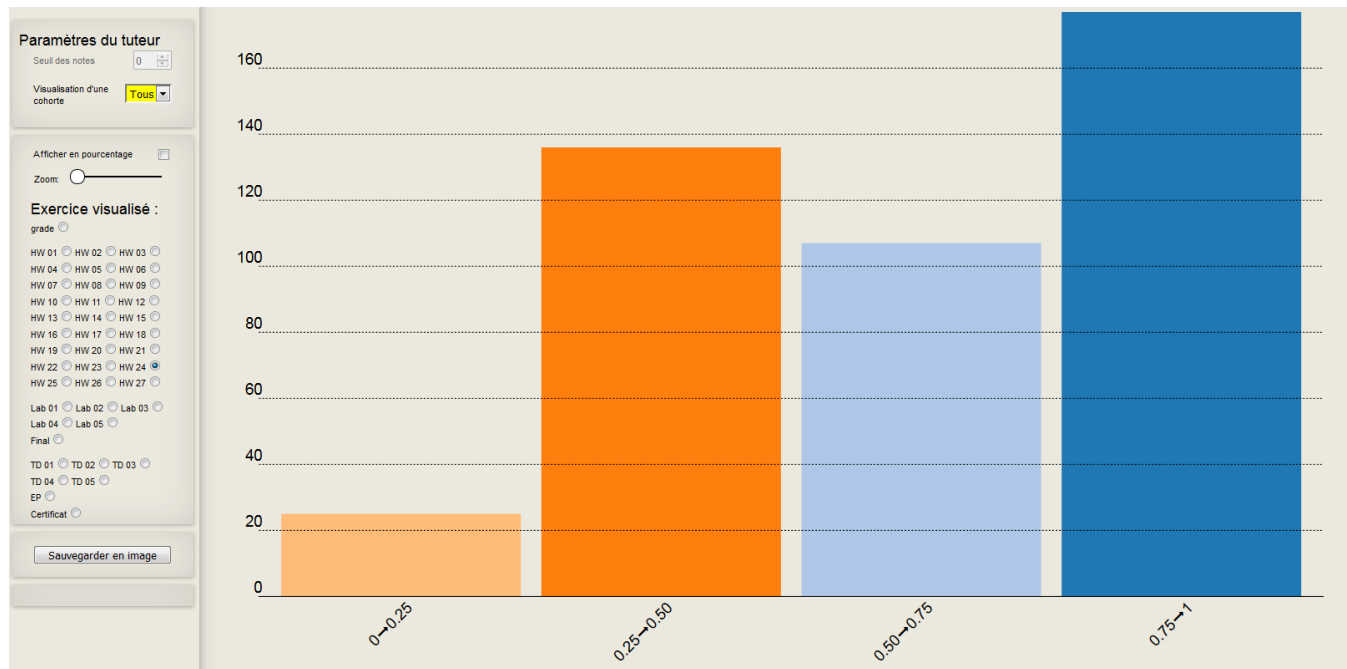
CHART 6

This statistical diagram shows :

→ Quality of completion and results for each exercise.

→ Columns:
→ quartiles from 0 to 1.
→ number of learners who completed a selected exercise (selection on the left) and have a grade in this quartile

Benefit: almost the same but little bit more precise information as in edX

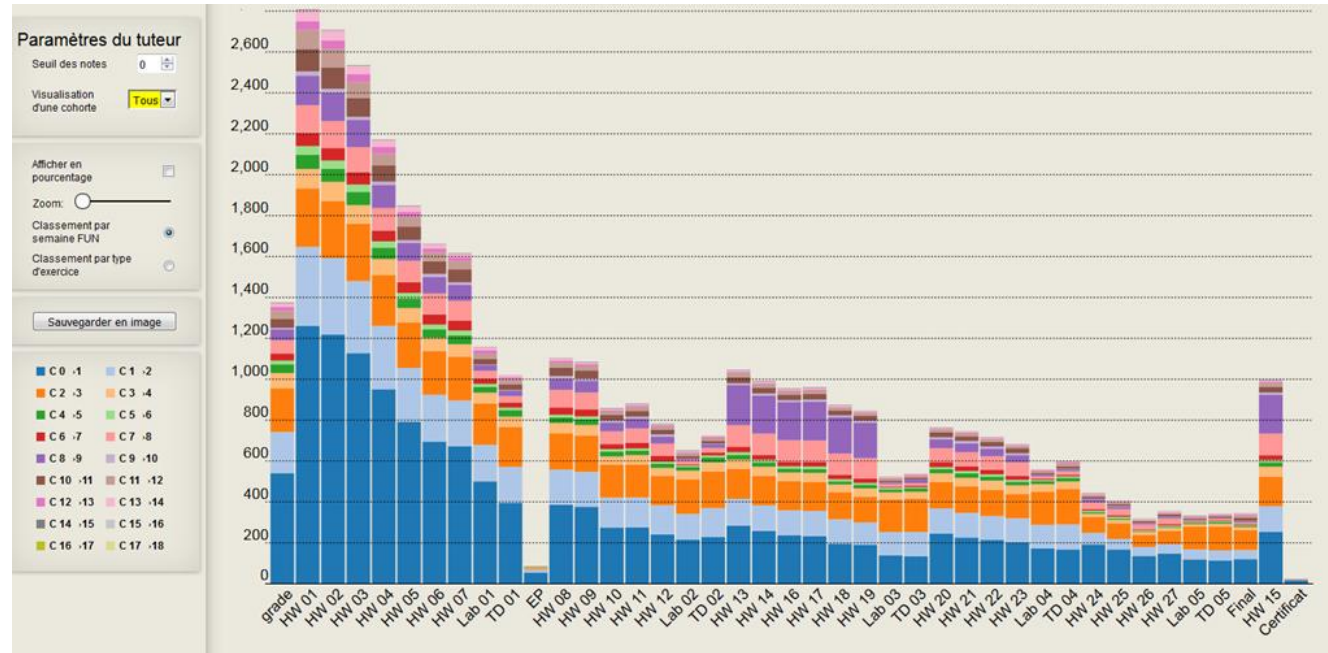


Learners: exercise / registration period

CHART 5

→ Number of learners who completed MOOC exercises according to each MOOC registration period.

→ Columns are exercises and contain all learners having completed each exercise distributed according to their registration period.

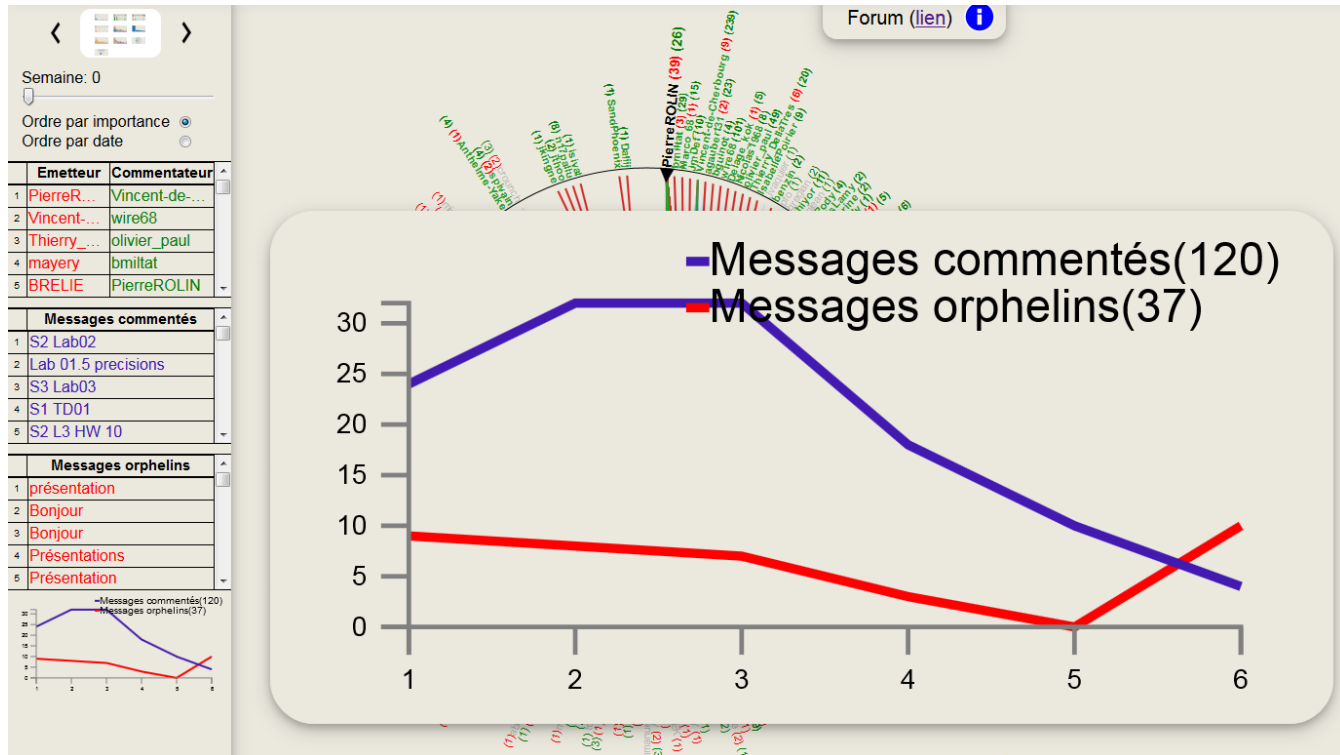


Forum Analysis: Hovering bottom-left

CHART 9

Bottom left graphics:

→ number of commented messages, and number of orphan messages



Demonstration +

MOOC-Pilot information

- www.mooc-pilot.com/DEMO
- Michel Plantié, Pierre Rolin, Laurent David
- Email: michel@plantie.fr
- Tel : +33602113240