

Identifying Opportunities to Improve Student Outcomes

OU  Analyse

Jason Lee

Summary

Overall Outcomes

- Modules AAA and GGG have the lowest number of students signed up but register the highest percentage of positive student outcomes. 71% of students in AAA and 60% in GGG finished with Pass or Distinction.
- For both 2013 and 2014, J courses (October start) averaged a +4.3% improvement in the passing+distinction rate than their predecessor B (February start) courses.
 - More students are also signing up in the J (October) cohort than B (February).
 - In 2014 more students have withdrawn from courses, meaning more students are leaving before they fail.
- In 5 modules, students registering closer to the start date have a higher chance of passing or distinction than those registering earlier.

Demographic Trends

- There is an imbalance of gender population across modules. Females represent > 80% of the students in BBB and GGG, while Males represent 60-90% of the students in CCC, DDD, EEE, and FFF.
- Students with lower previous education level are more likely to withdraw and fail from a course, which would imply different background influence their progress and potentially work ethic.
 - For context, students with *No Formal qualifications* failed 31% of the time, while HE qualifications failed only 18%.
- 35-55 year old students average a +5.5% improvement in passing+distinction rate over 0-35-year-old students.

Engagement Levels

- Modules that have students using VLE more frequently are not getting better outcomes.
 - FFF has the most substantial VLE per student ratio but has the 3rd lowest passing+distinction rates amongst all modules.
 - Conversely, GGG has the lowest VLE per student ratio but the 2nd highest passing+distinction rate, and only 11% of students withdrew from this course, compared to most modules with a withdrawal rate of > 30%.
- *Forumng* is the most used VLE activity with 2.4M sessions. Students who use *forumng* as their primary activity type register the highest median score of 79.
 - A +2-8 score improvement over other VLE activity types, such as *oucontent* and *subpage*.

Recommendations

Sorted in order of importance - descending

Encourage/Increase Community Learning

Using VLE more frequently doesn't necessarily mean students will score better or have a higher chance of passing/distinction. VLE activity types play a crucial role in how students perform. In particular, data has shown that when students use *forumng* as their primary activity type, they average higher scores. Assuming **forumng** is related to online forums/communities, this tells us students perform better when they work together. We should create **more community learning** activities. Then measure the impact by comparing student outcomes and assessment scores to validate if increased community learning improves results.

Changes Course Structure

An opportunity to improve student outcomes is to develop course material that mirrors the structure of modules **AAA** or **GGG**. Though these modules have fewer students, they have lower withdrawals, higher passing rates, and more students using VLEs, which indicates students are engaged and thriving. Similarly, **J (October)** courses outperform B (February) with more sign-ups and better student outcomes. This is a sign that seasonality between start dates impacts student behaviors. We should **update course structures** to be similar to AAA, GGG, and J (October) start dates. This will enable us to see if course styles impact outcomes.

Develop Additional Support and Resources

We have seen that there are imbalances between student's outcomes based on their age, region, previous education level across all modules. It is a concern when students with lower previous education are withdrawing and failing at a higher rate. To ensure course material is suited for all levels, we should run surveys or focus groups to understand what is driving them to leave and how material can be improved.

Resources

Links

- [SQL/Python Code - Google Colab Notebook](#)

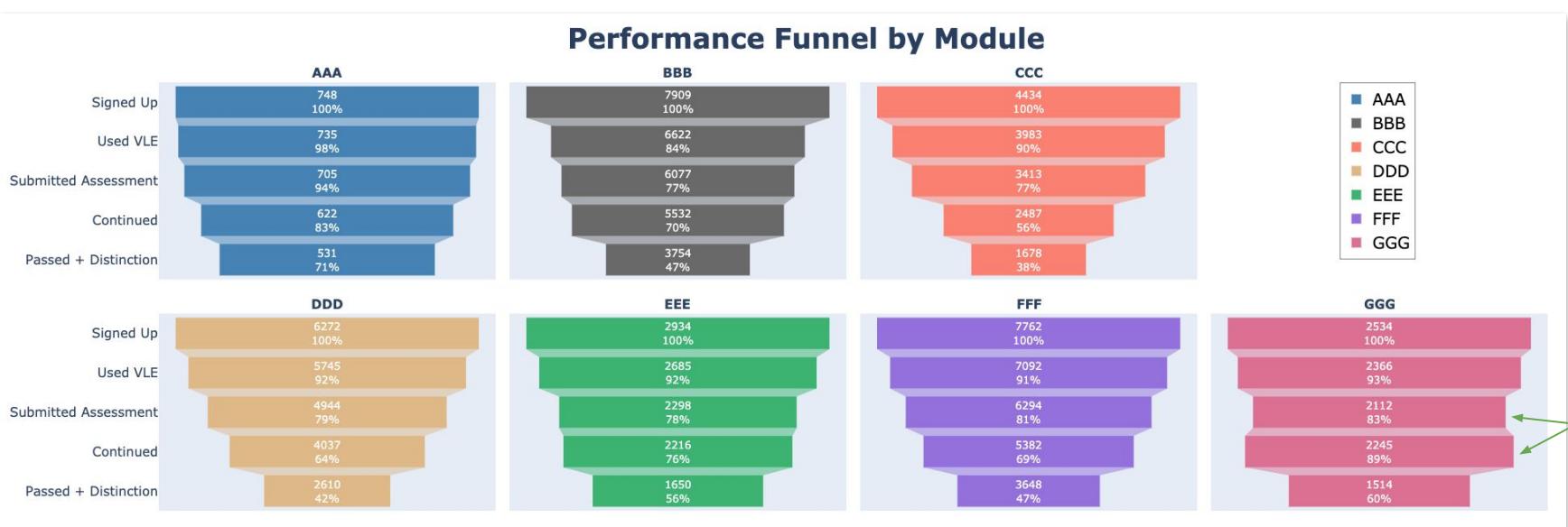
Glossary

- **Signed Up** - The total number of students signed up.
- **Used VLE (%)** - The total number of students who used VLE at least once.
- **Submitted Assessment (%)** - The total number of students who had submitted at least one assessment.
- **Continued (%)** - The total number of students who were still registered (i.e., excluding the students who unregistered/withdrew)
- **Passed + Distinction (%)** - The total number of students that either passed or had Distinction.
- **Failed (%)** - The number of students that failed
- **Withdrawal (%)** - The number of students that withdrew from a module
- **Date Registration Days** - The number of days a student took to sign up before/after a presentation start date (negative = before)
- **Disability rate (%)** - The number of students with a disability / total number of students
- **VLE per Student (Ratio)** - Total number of VLE sessions divided by the total number of unique students
- **VLE Viewed** - total number of VLE sessions recorded
- **Click per Student (Ratio)** - total number of VLE session clicks / total number of students.
- **Click per VLE (Ratio)** - total number of VLE session clicks / total number of VLE sessions.
- **Average Score** - The average score a student records across all of their assessments

Modules AAA and GGG have more successful student outcomes

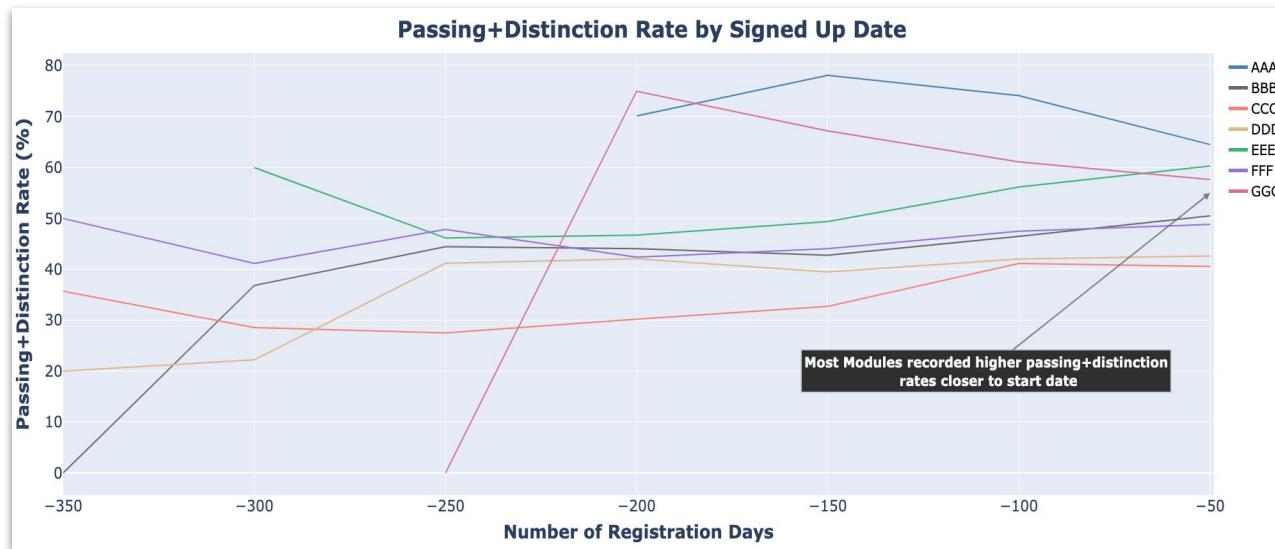
- 748 students signed up for **AAA**, significantly lower than the other modules, which had > 2.5K sign-ups.
 - Despite fewer students, AAA records the **highest conversion rate** in each level of the funnel below.
- **BBB** had the lowest percentage of users (84%) *using VLE* material, averaging -6% lower than all other modules.
 - BBB's *passed+distinction rate* was 47% (3rd lowest), and *submitted assessment rate* 77% (joint lowest)
- **CCC** registered the lowest *continued rate* (56%) and *passing+distinction rate* (38%), which would imply difficulties, quality, or hurdles students faced in the module.
- **GGG** is the only module with a higher percentage of students that *continued* than the previous level *submitted assessment*.
 - GGG also records the 2nd highest *passed+distinction rate* suggesting fewer assessments equates to higher continuation.

Performance Funnel by Module



Registration closer to start date results in higher passing+distinction

- Less than 2% of students across modules started **after** (i.e., positive registration days) the course start date.
- **AAA** and **GGG** are the only two modules in which as the *number of days* increases, the *passing+distinction rate* **decreases**.
 - Both modules recorded their lowest *passing+distinction rate* when students signed up between -50 to 0 days before the start date, 64.5%, and 57.6%, respectively.
 - Despite the decline, these two modules have the highest overall *passing+distinction rates*.
- The remaining modules (**BBB, CCC, DDD, EEE, FFF**) all record their **lowest passing+distinction rate** when students register between -350 to -250 days, then steadily increase and hit their **peaks** when students signed up between -50 to 0 days.

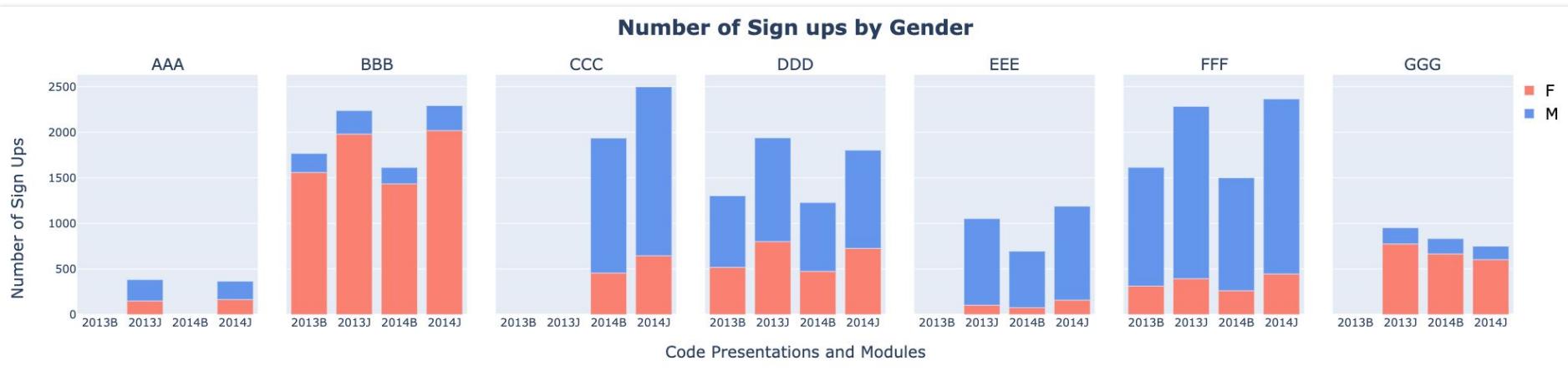


Number of Registration Days = the number of days measured relative to the start of the module-presentation (negative means days before module presentation started)

Modules are disproportionately uneven between demographics

- Overall, there are more sign-ups during the **J start dates** than **B** for 2013 and 2014, with 54.8% male and 70.3% between 0-35 years old.
 - More than 80% of the students in BBB and GGG are females.
 - The remaining modules (CCC, DDD, EEE, FFF) average 60 - 90% males.
- Passing+Distinction, Fail, and Withdrawal rates improve when the student has higher previous education levels.
 - Suggesting that course material is challenging or the student's work ethic is drastically different.

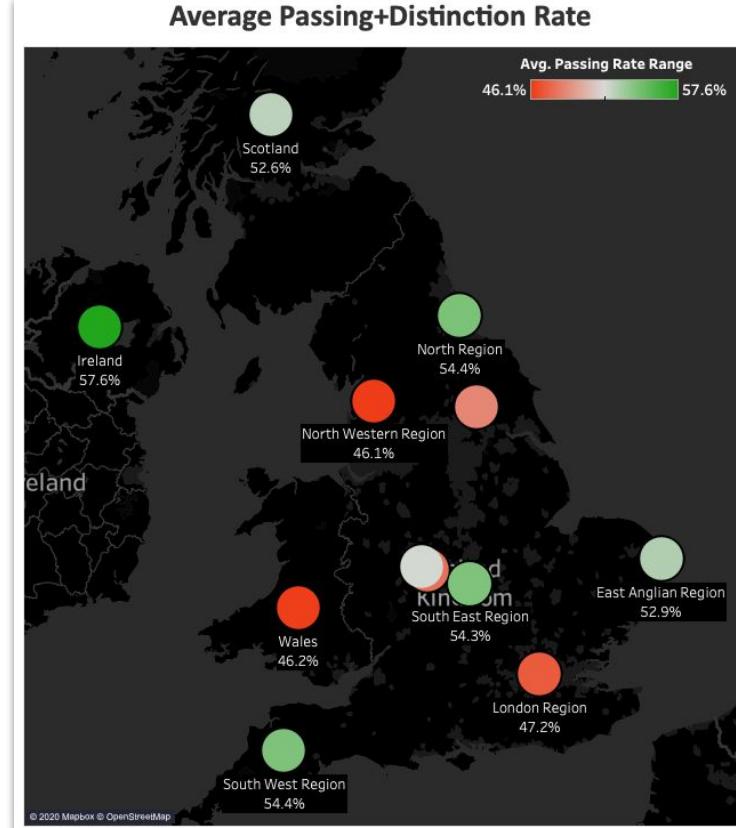
Education Level	Passing + Distinction	Fail	Withdraw	% of Students
No Formal quals	31.4%	30.7%	41.5%	1.1%
Lower Than A Level	41.9%	28.4%	35.6%	40.9%
A Level or Equivalent	56.0%	21.0%	29.4%	42.9%
HE Qualification	60.0%	18.2%	27.8%	14.2%
Post Graduate	70.6%	12.7%	25.0%	0.9%



Students living in the Wales region struggle with passing courses

- 4 regions recorded average passing+distinction rates below 50%, including *Wales, North Western, London, and Yorkshire* regions.
 - Surprisingly, **London** has a low rate when they have the largest population at approximately 9 million and is home to one of the world's busiest metropolitan cities in the world.
- The difference between genders passing+distinction rate is most spread in *Wales and Scotland*.
 - Wales: Males perform **+6.3%** better
 - Scotland: Females perform **+5.6%** better
- Students between **35-55** years old represent only 29% of the population but average a **+5.5% improvement** in passing+distinction rate over 0-35-year-old students.

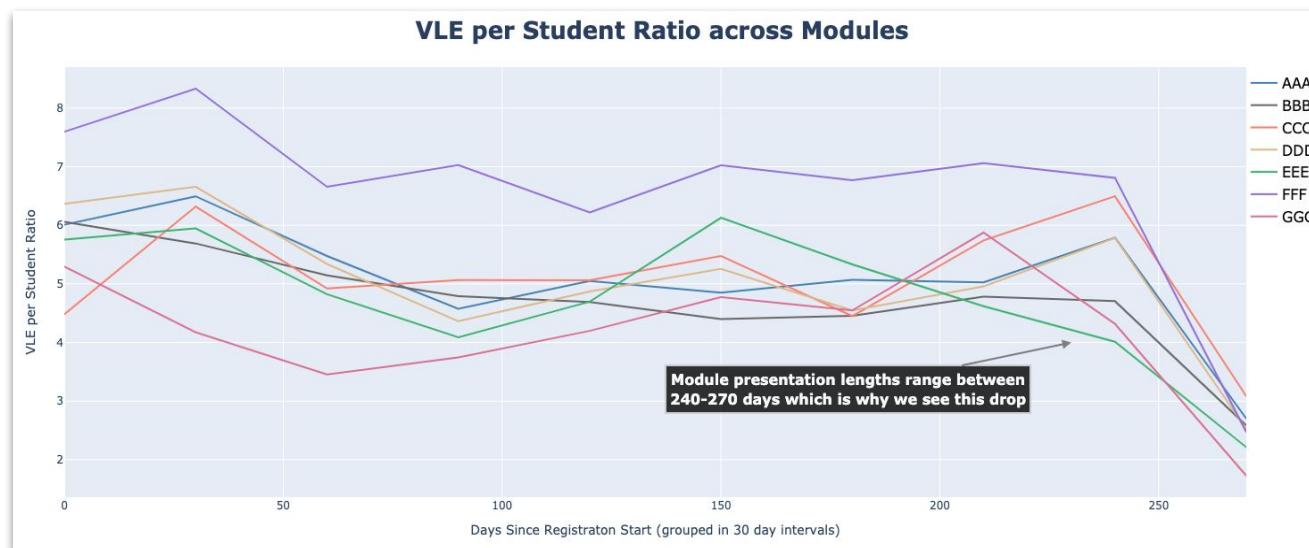
Module	Age (0-35)	Age (35-55)	Change
AAA	68.5%	73.2%	+4.8%
BBB	44.3%	53.9%	+9.6%
CCC	36.1%	41.6%	+5.5%
DDD	40.3%	44.9%	+4.6%
EEE	55.4%	58.5%	+3.1%
FFF	45.7%	50.6%	+5.0%
GGG	57.4%	63.4%	+6.0%



Passing+Distinction Rate = number of student finished with "passing" or "distinction" / total students that signed up

More VLE sessions does not result in better student outcomes

- FFF (purple line) records the **highest VLE per student ratio**. (**Reminder:** FFF had 3rd lowest passing+distinction rate)
 - Meaning students are very active in using the VLE material throughout the entire duration of the course.
 - No other module exceeds a ratio of 6.7 VLE per student.
- GGG (pink line) is the only module where the *VLE per student ratio* is not in line with the majority.
 - The ratio drops to 3.5 for 60 days since registration, which is by far the lowest across modules.
 - This number eventually increases as the days increase, which indicates that fewer students find the need to utilize VLE early in the module. (**Reminder:** GGG had the 2nd highest passing+distinction rate and highest continued rate)



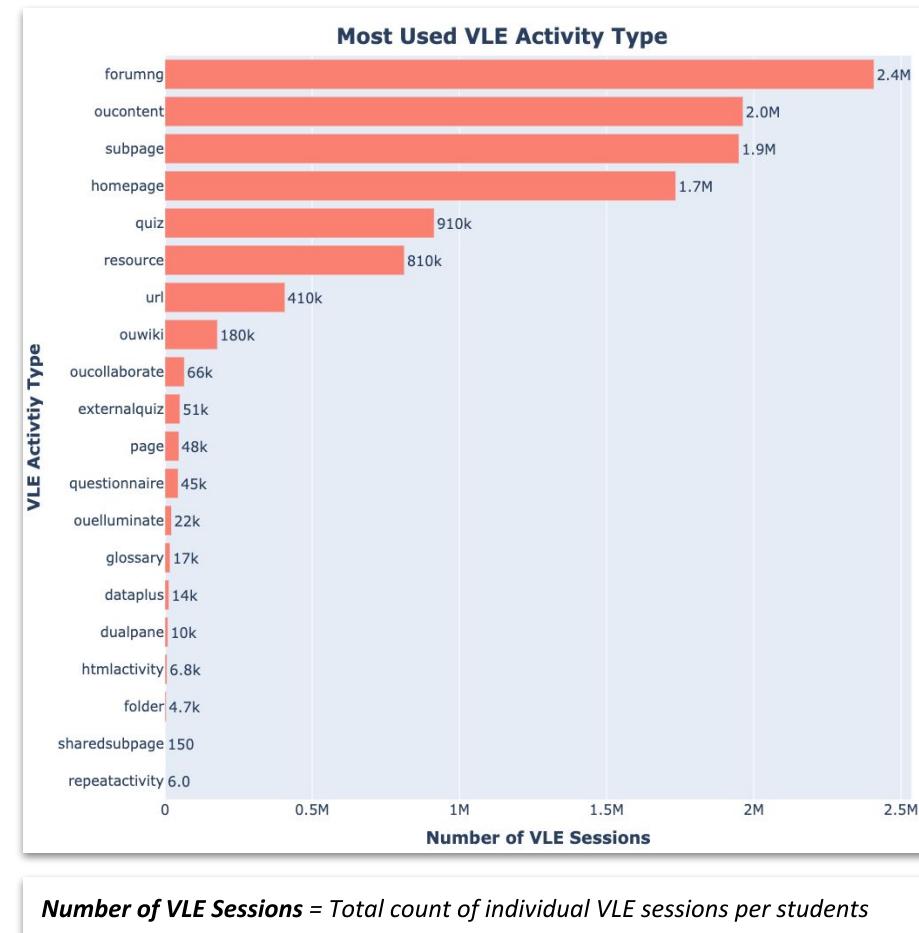
VLE per Student Ratio = number of VLE interactions per student

Days Since Registration Start = days since the presentation start date grouped in 30-day intervals

Students using *forumng* as their main VLE recorded higher scores

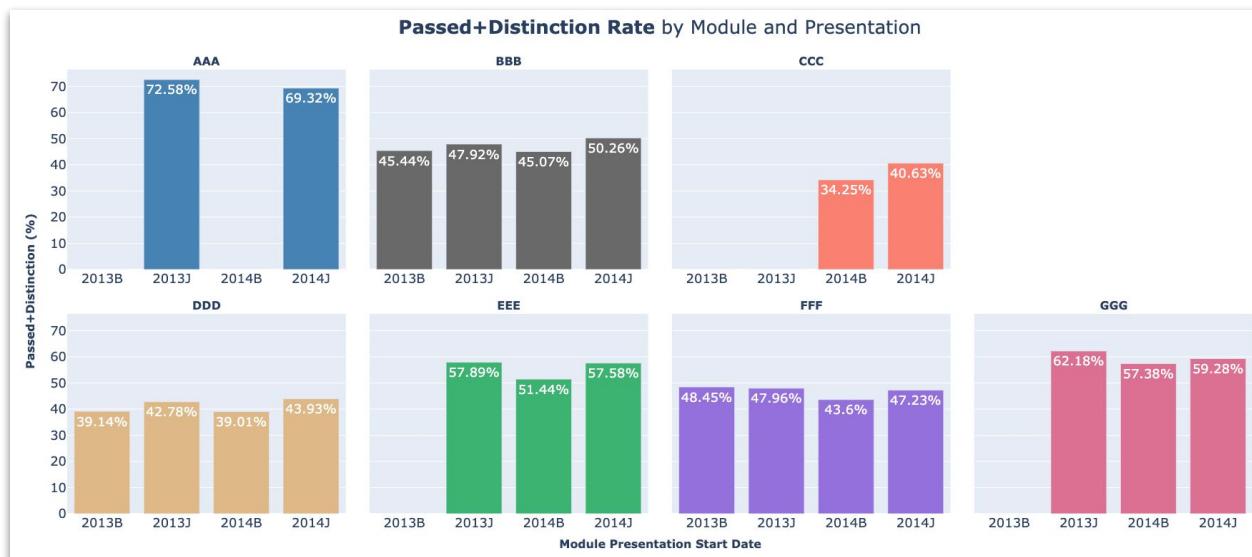
- *forumng* had **2.4M** VLE sessions, approximately +500K more than the next two most used activities *oucontent* and *subpage*.
 - Despite more sessions, 4 other activity types registered more active students, which means the same students frequently use *forumng*.
- When students use *forumng* as their primary VLE activity they record the highest median score **79** than other activities.
 - Inversely, modules that have more *forumng* result in fewer students finishing with **distinction**.
 - More quizzes in modules also result in fewer students passing the course, evidently meaning the VLE is too tricky.

No.1 Ranked Activity Type per Student	Median Score	% of Outcomes ≥ 80 Score
forumng	79	49.8%
oucontent	77	40.7%
subpage	71	27.6%
homepage	71	29.6%
quiz	76	38.9%



J start dates have higher passing+distinction rates compared to B

- AAA had the highest overall *passing+distinction* rate, but between 2013J and 2014J, results dropped by -3.3%, the most significant decline across a 1-year start date with all modules and presentations.
- For both 2013 and 2014, **J courses** (October start) record on average +4.3% improvement in the *passing+distinction* rate than their predecessor B (February start) courses.
 - Suggesting the student behavior or changes in course structure or difficulty could be influencing overall outcomes.
- CCC has the lowest *passing+distinction* rate amongst modules but registered the **most substantial improvement** between 2014B and 2014J, increasing by +6.3%.



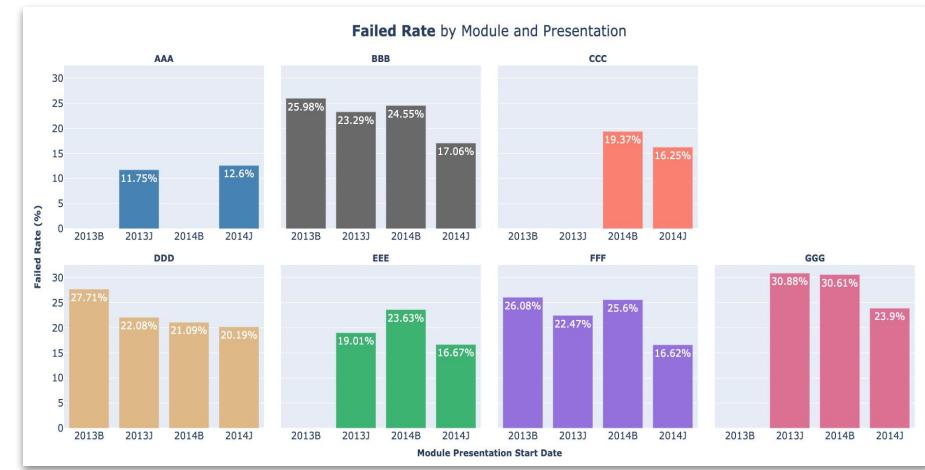
Passing+Distinction Rate = number of student finished with "passing" or "distinction" / total students that signed up

Higher number of *withdrawals* are leading to fewer *failed* outcomes

- Except for CCC, all modules have been steadily **increasing** in the number of **withdrawals** since the first presentation 2013B.
 - The most recent presentation **2014J** recorded the highest number of withdrawals for AAA, BBB, EEE, FFF, and GGG.
- Inverse to the withdrawal patterns, the number of students **failing** has been **decreasing**.
 - More students are withdrawing, which means fewer students in situations that would result in them failing.
 - Students struggle = more withdrawals and fewer failings.**
- These numbers indicate that modules are getting challenging or are declining in quality which is driving students to leave the courses.
 - Developing course material that mirrors low withdrawal course such as AAA or GGG could be an opportunity to improve outcomes.
 - AAA and GGG have the lowest withdrawal rates below 20%.



Withdrawal Rate = number of student finished that "withdrew" / total students that signed up



Failed Rate = number of student finished that "failure" / total students that signed up