ONLINE ACTIVITY ANALYSIS TOOL (OAAT)

For version 2.3
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Educational Development Centre
The Hong Kong Polytechnic University

Educational Development Centre

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Online Activity Analysis Tool

Contents

Introduction

The Online Activity Analysis Tool (OAAT), developed by The Hong Kong Polytechnic University's Educational Development Centre (EDC), can be used to analyse usage data from Blackboard(Bb) courses. Visualizations and summary tables can be generated for you to do simple learning analytics. Statistical analysis can be performed to help you find out whether the students' online engagement effects their achievement or not. Raw data is also provided for you to explore further exploration and if possible, combine with other datasets to do further analysis by yourself.

This tool is easy to use, and you don't need to install or learn to use any new software. All you need to do is to archive your Bb course and have the Microsoft Excel program installed on your computer.

Our Team

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Computer Requirements

The computer requirement for latest version of OAAT (v2.0x) is:

For Windows® only (Windows® 10 preferred)

For Microsoft® Excel™ (2013 or above)


For Blackboard®

Note: The Online Activity Analysis Tool is an independently developed add-in function and is neither affiliated with, nor authorized, sponsored, or approved by, Microsoft Corporation

3 steps before using OAAT

Step 1. Ensure System List separator is a comma (,)

System list separator impacts how functions are entered in Excel, e.g. to separate the arguments in a formula.

To ensure your system list separator is a comma (,), please go to **Control Panel** > **Region** > choose **Formats** tab > select **Additional settings** > choose *Numbers* tab > select ","
in the pull-down menu next to **List separator** > click **OK**.
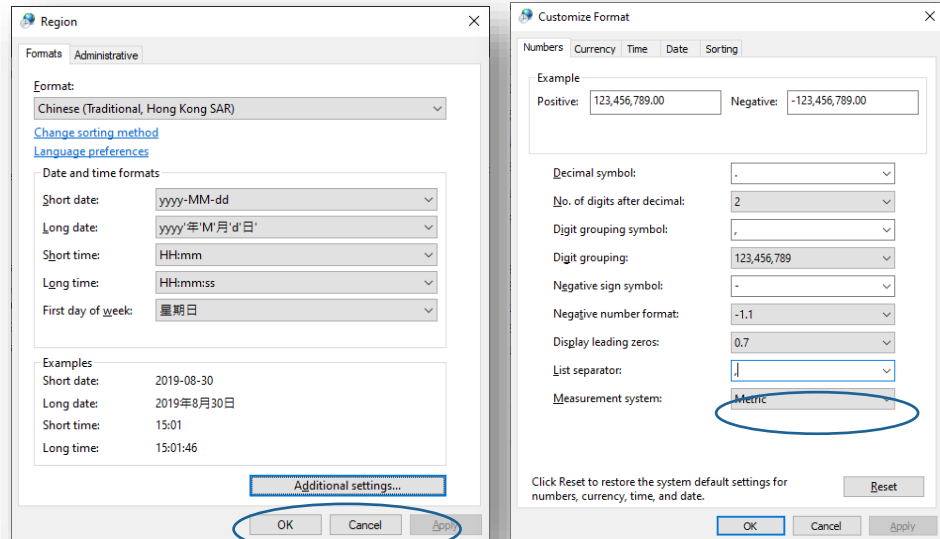
Step 2. Check your Excel version, 32-bit or 64-bit?

There is different version of OAAT for 32-bit or 64-bit Microsoft Excel. To check which OAAT version to download, please open **Microsoft Excel** > choose **File** tab > go to **Account** > click the icon **About Excel** > find the excel version on the top of the pop-up window
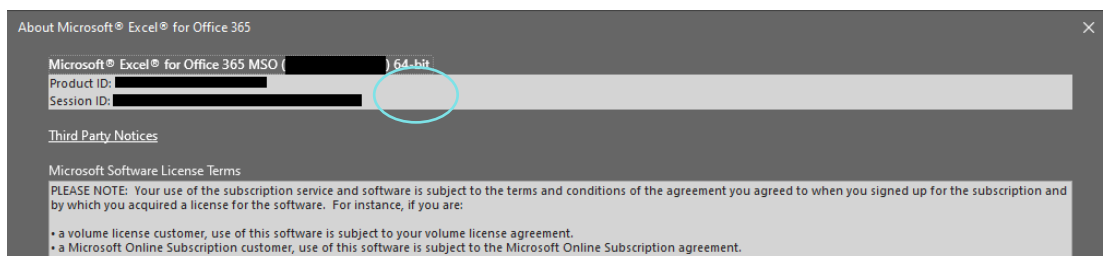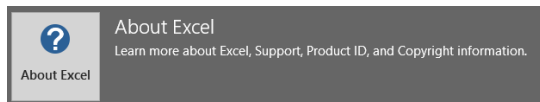
Step 3. Download the archive of your Blackboard course

a) Login into the Blackboard course that you want to extract data from.

b) Go to the **Control Panel** at the bottom left corner. Choose **Packages and Utilities** and then **Export/Archive Course**.

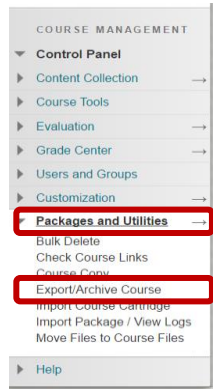> ***What is the archive course feature?***
> *The archive course feature creates a frozen snapshot or permanent record of your course. An archive will include all the content, course statistics, users, and course interactions, such as blog posts, discussions, and grades.*
>
> (source from https://help.blackboard.com/Learn/Instructor/ Course_Content/Reuse_Content/Export_and_A rchive_Courses)

c) On the Export/Archive Course page, select **Archive Course**.
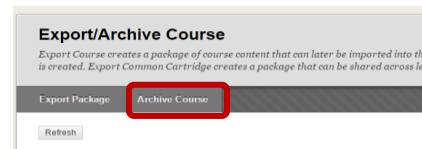
d) On the Archive Course page,
    - select the check box for Include **Grade Center History** (this is for marks extraction)
    - In the File Attachments section, select ***copy only links to course default directory files*** and ***copy only links to files stored outside of the course default directory***

    Then select **Submit**.

e) If the course archive is successful, you will see a message displayed.
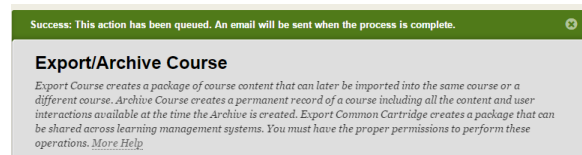
f) After waiting for several minutes, you may receive an email. You can go back to the page **Export/Archive Course** and download the archived file by clicking on it.
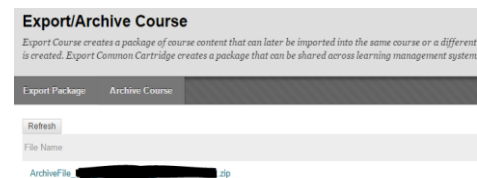
When you open the OAAT

Security Notice

When you open the OAAT in Excel, a security message appears. To open the tool, select *Enable this add-in for this session only.*
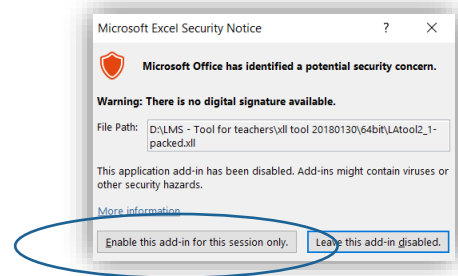
OAAT add-in Tab

Once the tool opens, you will find a new tab called "*EDC LA*" in your Microsoft Excel menu ribbon. This is the OAAT. When you click on EDC LA, you will find all the features available in OAAT as shown in the figure below.

Import Grade Center information and generate worksheet **GradeCenter** & **Correlation**

Import discussion forum data and generate results

Generate student email list by using keyboard key "Ctrl" to select student IDs

Import LMS data and generate worksheet **Overview** & **Stud_usage**

Export posts in the discussion forum to an Excel file

Predict students' achievement from their usage or assessment results

Open outlook with the student email list generated by using keyboard key "Ctrl" to select student IDs

Saving your analysis

After generating the results, if you want the results for further analysis or future use, you should save the worksheet with analysis into another Excel file.

Using the OAAT again

If you have already imported a set of data and would like to look at another set, you should open a new Excel workbook and import the new data.

Features of OAAT

Overview of course usage

Usage of course features and materials by students

Correlation between marks and students' usage

Predict student achievement from students' usage

Extract marks for each assessment by students

Summary of forum participation by students

Set the specified period for analysis

Export forum posts by students
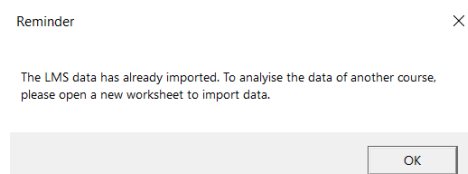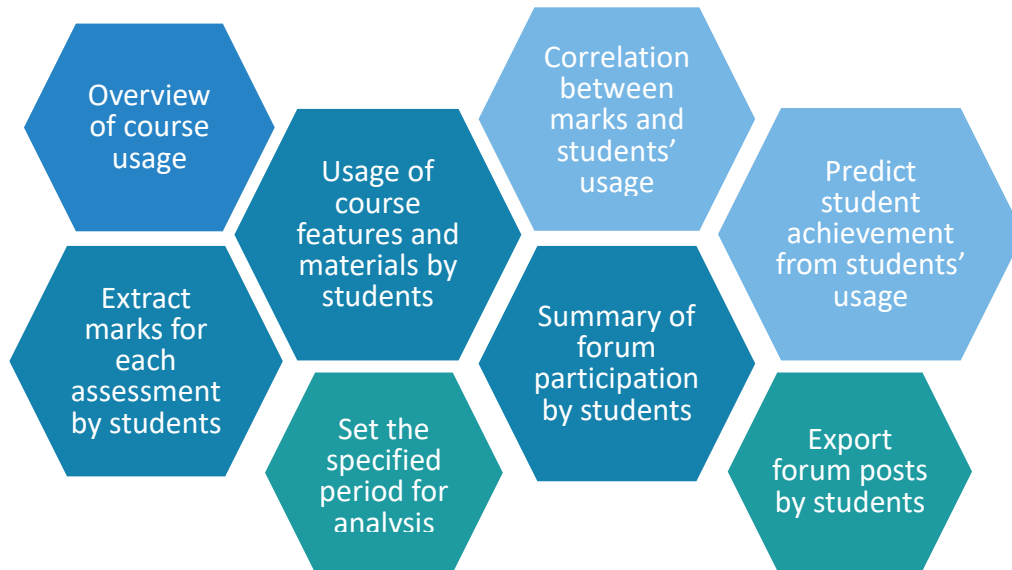
For OAAT version 2.3 released in March 2019

Data Import

To import the data, click on the ***Import data*** button on the OAAT tab and then choose your archived Bb course zip file. Note, there is no need to unzip the Bb course archive. It takes 1 to 3 minutes to extract data and produce charts and tables (depending to the amount of your course activities), so please be patient. When the import finishes, the processing time will be displayed and two worksheets, ***Overview*** and ***Stud_usage,*** will be generated.

Progress — □ ×

Unzipping - The zip has already been unzipped. - Done
Creating worksheets - Done
Loading data - Done
Exporting data - Done
Processing data.....

Data extraction ×

The data extraction has been completed.
Processing time: 00:03:13s.

OK
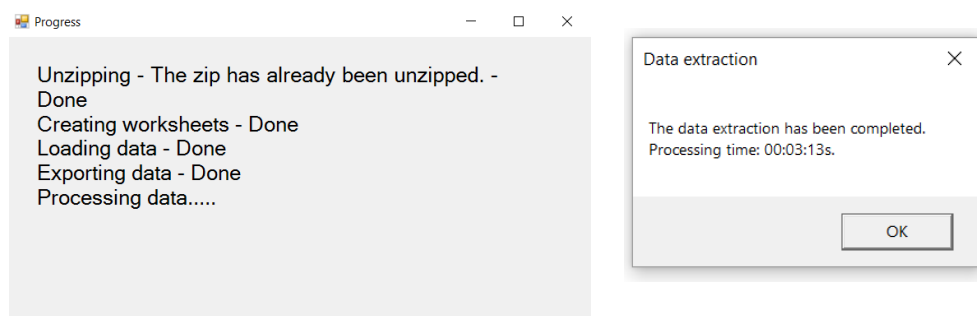
Overview of the students' course usage

You can find a summary of the course usage during the specified period in the worksheet called **Overview**:

- The pie chart shows the percentage of student enrolled in the Bb course who have logged into the course
- The line chart shows the total course login by all the students in the course over the specified period. Each dot represents the total course login for a day
- This bar chart shows the Top 10 materials in content areas with the highest clicks
- This table shows the percentage of students that have accessed the different features. It also shows the average clicks, standard deviation and the percentiles of the clicks for different features

This can help you get an overall picture of how your students are doing in the Blackboard course. You may also specify the period that are interested in analysing.

> *You can specify the period you want to analyze in the green highlighted cells, both date and time!*
>
> *Worksheets* **Stud_Usage**, **Correlation** *and* **Overview** *will be then automatically updated. The default period is from the earliest to the latest action according to the archived Blackboard course. If only the date has been input, the time will be automatically defined as "00:00:00".*
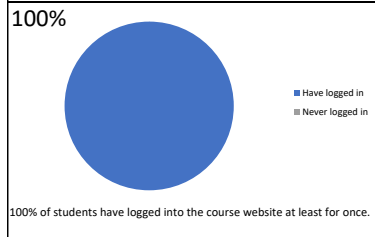
Dashboard - Overview

	From	To
Period:	2018-09-01 12:15:46	2018-12-09 07:14:11

Total Student Enrollment in LMS course	71

% of student who has logged in within the period

100%

■ Have logged in
■ Never logged in

100% of students have logged into the course website at least for once.
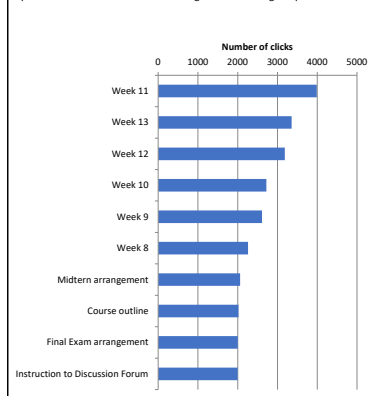
Total Course login over the period
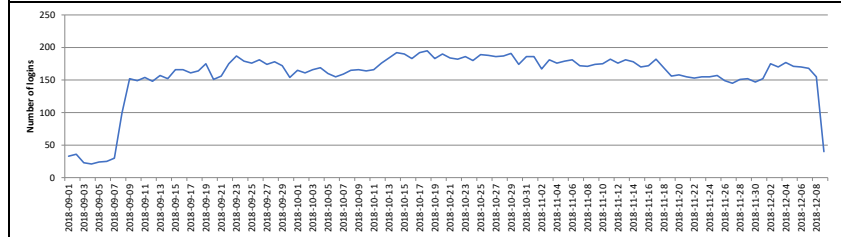
Course materials in content area

Top 10 materials in content area with highest click during the period

Feature Usage

This table shows the percentage of students accessing a feature at least once. The mean, standard deviation and percentiles of clicks for different features are also shown.

	Feature	% of Students who have accessed the feature	Number of clicks						
			Mean	SD	Median	5th percentile	25th percentile	75th percentile	95th percentile
Course-oriented	Content	98.6%	506.10	311.52	516.00	27.50	226.00	782.50	947.50
	Grade Center	98.6%	24.00	13.50	24.00	2.00	16.00	34.00	45.00
	Groups	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Assignment	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Test/survey	97.2%	24.35	15.49	21.00	3.00	11.50	38.50	48.00
Communication	Announcement	100.0%	24.65	21.55	15.00	4.00	8.50	34.50	69.50
	Email	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Message	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Discussion Forum	100.0%	50.03	32.98	39.00	11.50	27.00	65.00	119.50
Tools	Journals	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Blogs	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Wikis	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Turnitin	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Glossary	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Admin	Calendar	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Roster	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Contacts	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Individual students' course usage

You can look at the the usage (clicks) for each student in the Bb course within the specified period in the worksheet called ***Stud_usage***. On the left-hand side of the table, students' usage for different features is shown, while on the right-hand side of the table, the clicks on each type of material by students is deisplayed. The total number of clicks by students of different features in the course are calculated at the bottom of the table.

Coloured symbols (green and red triangles) are used to indicate students with usage of features among the Top/Bottom 5% of the class. You can copy the usage data to other files for further exploration or analysis.

This worksheet is automatically updated according to the period specified in worksheet ***Overview***.

Student Usage on Blackboard features and course materials

Assessment Marks in Grade Center

The worksheet, ***GradeCentre*** shows the marks for different assessments for each student in the Grade Center.

You can copy the data here to other files for further exploration or analysis. As the assessment information is extracted as at the date the Bb course is archived, it remains the same regardless of the period specified.

Marks and grades from Grade Center

User ID	User name	Grades for Discussion Forum 1	Grades for Discussion Forum 2	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Midterm Test	Final Exam	Total scores	Subject grades
stuAcc01	Kaiser Felix	1	1	48	48	27	12	32	22	67	61	57.67	4
stuAcc02	Guzman Barney	1	1	0	28	18	0	6	7	49	20	25.57	2
stuAcc03	Schmitt Clyde	1	1	46	30	10	33	21	36	12	36	31.28	2
stuAcc04	Flowers Maryanne	1	1	43	24	0	13	27	10	27	22	24.11	2
stuAcc05	Melton Agustin	1	1	82	38	18	24	55	71	84	69	68.84	5
stuAcc06	Callahan Daryl	1	1	49	58	19	30	27	53	82	67	65.68	5
stuAcc07	Duarte Rhonda	1	1	27	4	18	20	21	10	48	24	29	2
stuAcc08	Bishop Polly	1	1	72	22	24	32	20	10	72	37	44	3
stuAcc09	Rosario Rosendo	1	1	42	7	21	30	25	11	12	36	30.08	2
stuAcc10	Singh Audrey	1	1	54	18	20	38	31	69	59	48	49.5	3

Correlation between Assessment and Engagement

The worksheet **Correlation** shows the correlation between entries in the Grade Centre and LMS usage. This can give you an understanding of whether and how strongly pairs of variables are related. This in turn may help you use LMS usage data to predict the assessment marks.

In this worksheet, only LMS usage data is updated automatically according to the period specified in worksheet **Overview**. As the assessment marks are extracted as at the date of archiving the Bb course, they remains unchanged.

Correlation between clicks on features and assessment grades

Grade Center Items	Course-oriented					Communication				Tools					Admin		
	Content	Grade Center	Groups	Assignment	Test/survey	Announcement	Email	Message	Discussion Forum	Journals	Blogs	Wikis	Turnitin Assignments	Glossary	Calendar	Roster	Contacts
Grades for Discussion Forum 1	-0.167	0.155			0.079	-0.211			0.348								
Grades for Discussion Forum 2	-0.200	0.138			-0.074	-0.125			0.603								
Test 1	0.613	0.095			0.226	0.482			-0.071								
Test 2	0.625	0.038			0.124	0.507			-0.164								
Test 3	0.495	0.004			0.149	0.320			-0.144								
Test 4	-0.067	-0.040			0.027	-0.081			-0.034								
Test 5	0.644	-0.001			0.091	0.591			-0.184								
Test 6	0.786	-0.036			0.167	0.646			-0.308								
Midterm Test	0.722	-0.008			0.240	0.513			-0.151								
Final Exam	0.826	-0.038			0.267	0.524			-0.287								
Total scores	0.879	-0.020			0.280	0.589			-0.253								
Subject grades	0.834	-0.001			0.297	0.566			-0.229								

Usage of discussion forum

The **DiscussionForum** worksheet shows a summary of individual students' participation in each forum, including the following information:

- number of views
- number of posts
- word count for posts
- day of First Post
- date of Last Post
- number of days since last post (as of reference date)
- Types of behaviours
    - *Active in all periods* – have created posts in all three periods*
    - *Active at the beginning* – have created posts only at the beginning (1st period)
    - *Active in the middle* – have created posts only in the middle (2nd period)
    - *Active at the end* – have created posts only at the end (3rd period)
    * The three periods are in equal length (days) between the start date and end date

- Types of Discussion Forum Use
    - *No show* – did not view or create any post
    - *Read only* – only view post but not create post
    - *Top 20% active* – students with total number of post and views that belongs to top 20% of the class
    - *Bottom 10% inactive* – students with total number of post and views that belongs to bottom 10% of the class

After clicking the **Forum Report**, it takes several minutes to extract data and produce statistics and charts (depending to the amount of your course activities). Please be patient. When the data extraction finishes, the processing time will be displayed and worksheet **DiscussionForum** will be generated.

Progress — □ ×

Creating worksheets - Done
Extracting group information - Done
Extracting post data.....

DF report ×

The discussion forum report has been generated.
Processing time: 00:01:30s.

OK

You can specify the period of interest in the red highlighted cells, both date and time!

*Worksheets **DiscussionForum** will be then automatically updated. The default period is from the **earliest to the latest action in discussion forum** according to the archived Blackboard course. If only the date has been input, the time will be automatically defined as "00:00:00".*

Discussion forum - Overview

	From	To
Period:	2018-09-10 12:00:00	2018-11-18 12:00:00

Forums:	2
Posts	1956
Reference Date(Ref.date)	2018-11-18
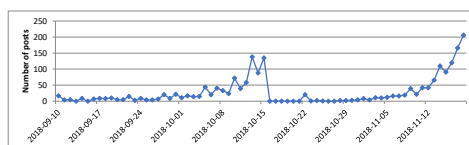
Rank (Top Authors)	Forums	Authors (User ID)	No. of views	No. of posts	Average word count per post each day	No. of posts each day	Day of First Post	Date of Last Post	No. of days since last post (as of ref. date)	Types of behaviours	Types of Authors
1	Discussion Forum after Midterm	stuAcc01	75	72			2018-10-22	2018-11-18	27		Top 20% active
2	Discussion Forum after Midterm	stuAcc08	38	57			2018-11-13	2018-11-18	5	Active at the end	Top 20% active
3	Discussion Forum after Midterm	stuAcc03	73	52			2018-11-03	2018-11-18	15	Active at the end	Top 20% active
4	Discussion Forum after Midterm	stuAcc06	36	48			2018-10-28	2018-11-18	21	Active at the end	Top 20% active
5	Discussion Forum after Midterm	stuAcc05	40	44			2018-10-30	2018-11-18	19	Active at the end	Top 20% active
5	Discussion Forum after Midterm	stuAcc09	60	44			2018-11-04	2018-11-18	14	Active at the end	Top 20% active
7	Discussion Forum after Midterm	stuAcc04	45	43			2018-11-03	2018-11-18	15	Active at the end	Top 20% active
8	Discussion Forum after Midterm	stuAcc02	63	42			2018-10-24	2018-11-18	25		Top 20% active
8	Discussion Forum after Midterm	stuAcc16	36	42			2018-11-05	2018-11-18	13	Active at the end	Top 20% active
10	Discussion Forum after Midterm	stuAcc19	47	38			2018-10-23	2018-11-18	26		Top 20% active
11	Discussion Forum after Midterm	stuAcc18	55	36			2018-11-06	2018-11-18	12	Active at the end	Top 20% active
12	Discussion Forum after Midterm	stuAcc11	35	35			2018-10-30	2018-11-18	19	Active at the end	Top 20% active
12	Discussion Forum after Midterm	stuAcc14	38	35			2018-10-31	2018-11-18	18	Active at the end	Top 20% active

Summary statistics of each forum are also displayed in the right hand side of the table in the worksheet **DiscussionForum**.

Forum title	No. of posts	Date of Last Post	No. of days since last post (as of ref. date)	Number of unique users
Discussion Forum after Midterm	1035	2018-11-18	0	71
Discussion Forum before Midterm	921	2018-10-15	34	71

Export of forum posts for further use

Clicking the **Export forum post** button can export the all the posts in Excel format, including time and content of the post, to a Excel file for further exploration (e.g., social network analysis, grading).

Group Name	Forum name	Published Date	Author name	Author netID	Thread title	Post id	Parent post id	content	content (without HTML tags)	post status
-	Discussion Forum before Midterm	2018/9/10 12:18	Kaiser Felix	stuAcc01	Re: Consumer behavior & s	793	NULL	"Firstly, to under	"Firstly, to underst	PUBLISHED
-	Discussion Forum before Midterm	2018/10/4 07:50	Guzman Barney	stuAcc02	Re: Consumer behavior & s	822	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/5 04:12	Flowers Maryanne	stuAcc04	Re: Consumer behavior & s	823	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/5 07:40	Guzman Barney	stuAcc02	Re: Consumer behavior & s	823	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/5 18:56	Melton Agustin	stuAcc05	Re: Consumer behavior & s	825	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/5 22:50	Flowers Maryanne	stuAcc04	Re: Consumer behavior & s	825	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/6 00:12	Guzman Barney	stuAcc02	Re: Consumer behavior & s	825	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/6 00:12	Guzman Barney	stuAcc02	Re: Consumer behavior & s	825	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/4 06:58	Guzman Barney	stuAcc02	Re: Define topic and state s	822	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/9 02:36	Melton Agustin	stuAcc05	Re: Define topic and state s	834	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/15 01:54	Callahan Daryl	stuAcc06	Re: Consumer behavior & s	859	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/5 23:22	Guzman Barney	stuAcc02	Re: Consumer behavior & s	825	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/6 13:45	Duarte Rhonda	stuAcc07	Critique of subliminal adve	826	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED
-	Discussion Forum before Midterm	2018/10/6 22:49	Schmitt Clyde	stuAcc03	RE: Critique of subliminal a	828	NULL	x x x x x x x x x x x x x x x x x x	PUBLISHED

Predicting student achievement

You can do prediction by choosing one student achievement (variables from Grade Center) as the dependent variable and factors affecting dependent variable (variables about LMS usage and from Grade Center).

Step 1. Choose the assessment marks that you want to predict (outcome)

Step 2. Choose the variables (usage or assessment marks) that you think have effect on the outcome

Step 3. Click the **Run Prediction** button to look at the results

The worksheet **Predict** will be displayed after running the prediction results. The following information will be provided:

- *Variance in students' performance explained by these factors (R-square)* – this indicates how well these variables predict the outcome variable. Its value ranges from 0% to 100%. It is proposed that a R-square of value 0.02 is considered to be "small", 0.13 to be "medium" and 0.26 to be "large" (Cohen, 1988).

  Reference:
  Cohen J. (1988). *Statistical Power Analysis for the Behavioral Sciences, 2nd Ed*. Hillsdale, NJ: Laurence Erlbaum Associates

- *Unstandardised beta* – represents the amount of change in the outcome due to a change of 1 unit of factor. You can use this to make comparisons within the prediction when just one measurement scale is in use.
- *Standardised Beta* – compares the strength of the effect of each factor to the outcome. The higher the absolute value of the beta coefficient, the stronger the effect.
- *Significant factors* – if the factor is statistically significant in predicting the outcome, the word **Significant** will be displayed to indicate that this factor has an effect on the outcome
- *Importance* – this will show the ranking of the factor on the importance of predicting the outcome. The lower the ranking, the higher the importance
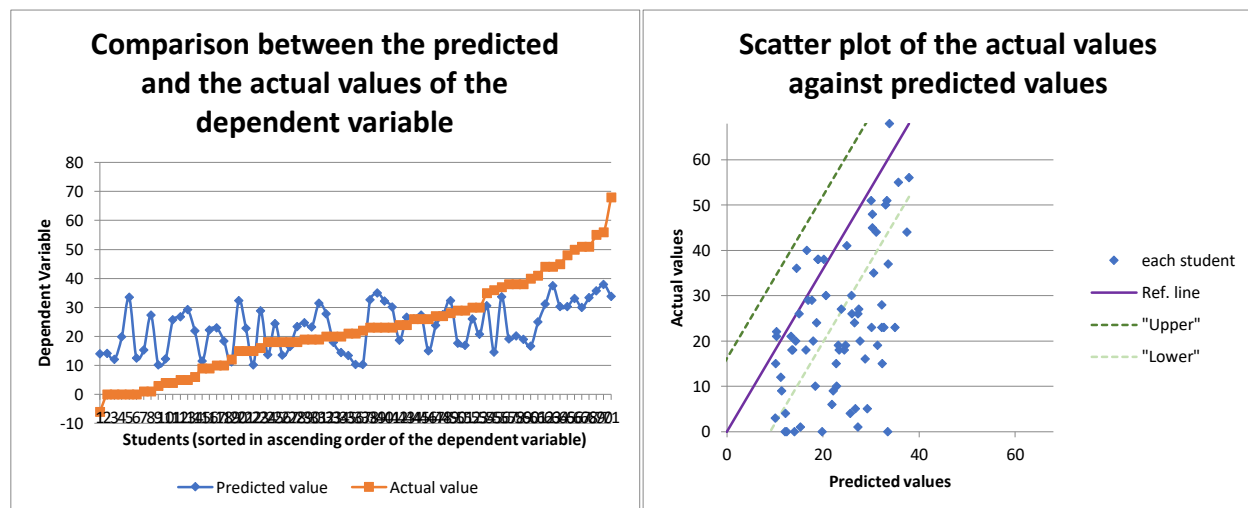
Prediction analysis (Model 1)

Dependent Variable (i.e., what you are predicting) =		5: Test 3
Variance in students' performance explained by these factors (R-square) =		24.5%
Number of students included in the analysis =		71

Factors affecting dependent variable		Unstandardised Beta (B)	Standardised Beta (beta)	Significant Factors	Importance (Rank)
Clicks in Bb features	1_1: Content	0.03	0.50	Significant	1
Clicks in Bb features	1_6: Announcement	0.00	0.00		

Comparison between the predicted and the actual values of the dependent variable

Scatter plot of the actual values against predicted values

Q&A

Q1   Can I use the Online Activity Analysis Tool (OAAT) on my Mac Book Pro, Mac Book, Mack Book Air or iMac?

Ans: The OAAT currently can be used in Windows only. Version for iOS is still under development.

Q2   Who do I contact if I have problems using the tool?

Ans: You can refer to the contact information in the below Support session.

Q3   Can I analyze data from any Learning Management System (LMS)?

Ans: Currently the OAAT can only be used to analyse data from Blackboard courses. But we hope to have a version that works with other LMS in the future.

Q4   Where can I get further information or examples of output from the OAAT?

Ans: You may visit our website (https://edc.polyu.edu.hk/OAAT) or contact us.

Support

For support, please contact Mr Chan Chun Sang (email: chun.sang.chan@polyu.edu.hk) or Ms Ada Tse (email: ada.sk.tse@polyu.edu.hk)

Online Activity Analysis Tool (OAAT)