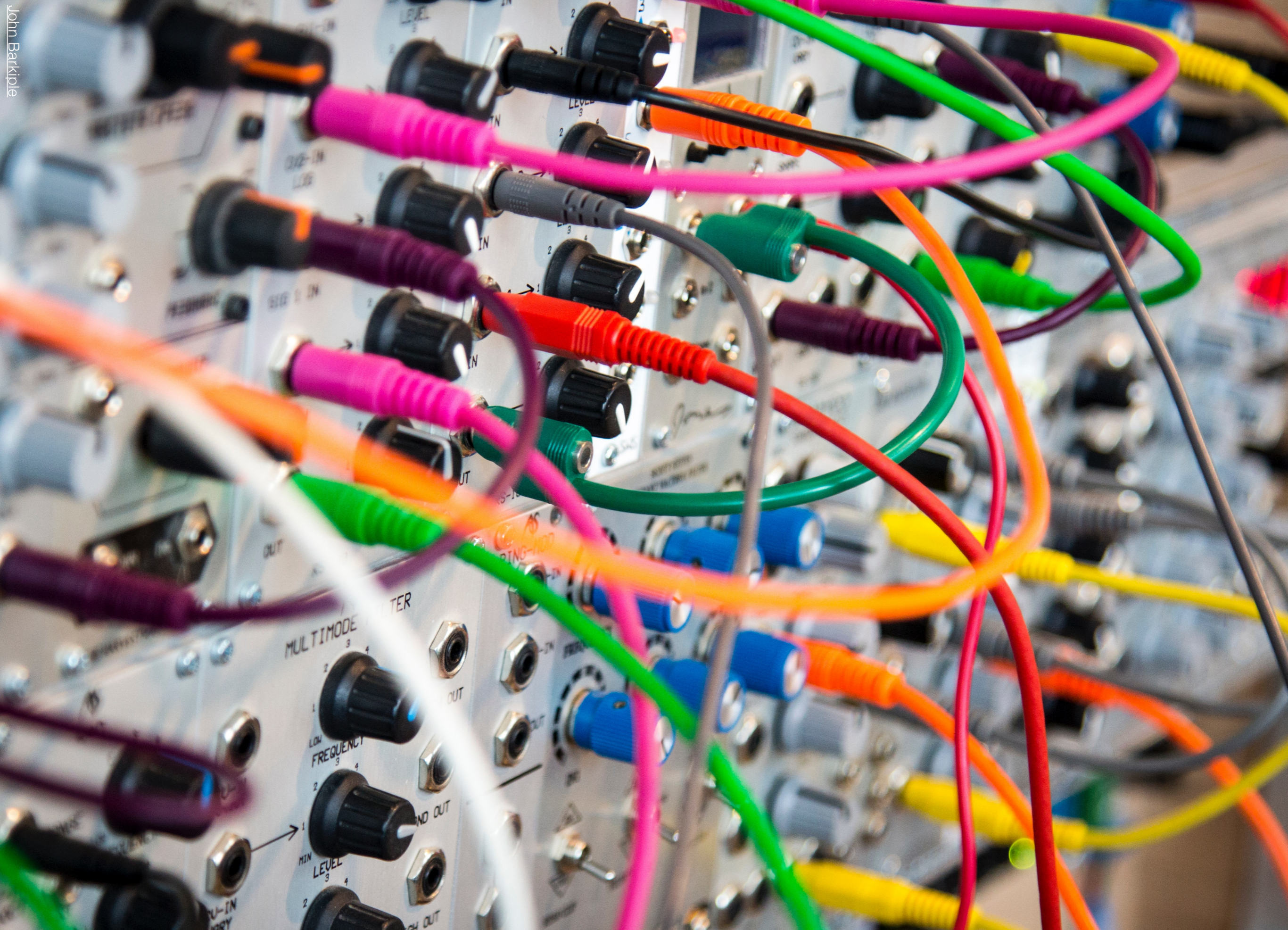


# OnTask: A tool to support the provision of personalised messages at scale



ESUP Days #31 & Apereo Paris 2021  
2 February 2021

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Data

Learning  
Analytics

Predictive  
models

Data

Large cohorts

Learning Analytics

Support Actions

Predictive models

Personalised messages

# 3-STAR LEARNING EXPERIENCES

AN EVIDENCE-INFORMED BLOG FOR LEARNING PROFESSIONALS

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## NO FEEDBACK, NO LEARNING

June 5, 2018

Paul A. Kirschner & Mirjam Neelen



Feedback is one of the most, if not the most important tools for supporting learning. Giving effective feedback has also been found to be one of the most powerful educational interventions to improve learning. According to Shank (2017) effective feedback positively affects learning outcomes and motivation to learn, and can help build accurate schema. John Hattie (2011) found that giving feedback has an extremely large effect on learning, with an effect size of 0,79 (2X the average of all other educational effects)...

Search ...

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### - TAGS -

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Data

Large cohorts

Learning Analytics

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Support Actions

Predictive models

Personalised messages

# Instructors manage workflows

The screenshot shows the 'Workflows' management interface. At the top left is a 'Workflows' navigation tab. At the top right are 'Admin' settings, a user profile, and a document icon. The main heading is 'Workflows\*'. Below it are two buttons: '+ New workflow' and 'Import workflow'. A 'Favourites' section contains two workflow cards. The first card is titled 'BIOL1011' and describes a 'Course on Cell Biology' with '14 rows, 69 columns, 9 actions.' The second card is titled 'Project rubric' and describes a rubric with '15 rows, 5 columns, 1 action.' Both cards have an 'Open' button and icons for edit, copy, delete, and star.

Workflows

Admin

## Workflows\*

+ New workflow Import workflow

### Favourites

BIOL1011	Project rubric
Course on Cell Biology	
14 rows, 69 columns, 9 actions.	15 rows, 5 columns, 1 action.
Open [edit] [copy] [delete] [star]	Open [edit] [copy] [delete] [star]



# A workflow contains a table

BIOL1011

## Table

+ Row + Column Views Dashboard Column statistics CSV Download

Show 10 entries Search:

	SID	email	Surname	GivenName	MiddleInitial	Gender	UOS Code	P
	300773633	euhz6532@bogus.com	Jen	Jie	M	male	ELON3509	
	315500979	zqdk2609@bogus.com	Iredale	Flynn	M	male	ELON3509	
	317547296	ckrn7263@bogus.com	Prenzel	Blake	I	male	ELON3509	
	319549896	ttqp9766@bogus.com	Chien	Jin	Y	male	ELON3509	
	320250819	tjxk6150@bogus.com	Tuan	Donglu	D	female	ELON3509	
	326285587	isim6886@bogus.com	Pan	Li Na	Y	female	ELON3509	
	330794979	olie8242@bogus.com	Chang	Lian	M	female	ELON3509	
	352120481	ucdx8510@bogus.com	Shao	Tain	L	male	ELON3509	
	360594548	euho9752@bogus.com	Vida	Bailey	C	male	ELON3509	
	363393232	tdrv2640@bogus.com	Hague	Joel	K	male	ELON3509	

Showing 1 to 10 of 14 entries

Previous 1 2 Next

● String | ● Number | ● Boolean | ● Datetime

You may drag and drop a column header to change its position in the table

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# Manual data upload/merge

Workflows Actions **Table** More

Admin

BIOL1011

1 2 3 4 5

## Select the type of data source

Operation	Description
<a href="#">+ CSV</a>	Upload data contained in a CSV file (typically saved using a spreadsheet or other data manipulation package). If the table is empty, the data will be simply loaded detecting those columns that have unique values for every row. If the workflow table has data, the operation will ask you to match a key column in your table with a key column in the file to upload so that the rows can be matched.
<a href="#">+ Excel</a>	Upload data from Excel file. Given a file name and the name of a sheet, upload or merge the content of the Excel file. If the workflow table has data, the operation will ask you to match a key column in your table with a key column in the file to upload so that the rows can be matched.
<a href="#">+ Google Sheet</a>	Upload data from a Google Sheet file. Given the URL pointing to a publicly available Google Sheet upload or merge its content. If the workflow table has data, the operation will ask you to match a key column in your table with a key column in the sheet so that the rows can be matched.
<a href="#">+ S3 Bucket CSV</a>	Upload data from a CSV file in a S3 Bucket. Given the key, secret, bucket name and file path to a CSV file, upload or merge its content. If the workflow table has data, the operation will ask you to match a key column in your table with a key column in the sheet so that the rows can be matched.
<a href="#">+ SQL Connection</a>	Upload data stored in a remote database using pre-defined SQL connection.
<a href="#">+ Athena Connection</a>	Batch upload data stored in a database using a pre-defined Amazon Athena connection.

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# Automatic data upload/merge

Django REST framework

Table Json Merge

## Table Json Merge

OPTIONS

GET

Basic methods to perform JSON merge.

get: Retrieves the data frame attached to the workflow and returns it labeled as "data\_frame"

post: Request to merge a given data frame with the one attached to the workflow.

GET /table/[id]/merge/

HTTP 200 OK

Allow: GET, PUT, HEAD, OPTIONS

Content-Type: application/json

Vary: Accept

```
{
  "how": "",
  "left_on": "",
  "right_on": "",
  "src_df": {
    "SID": {
      "0": [
        "1"
      ],
      "1": [
        "2"
      ],
      "2": [
        "3"
      ],
      "3": [
        "4"
      ],
      "4": [
        "5"
      ],
      "5": [
        "6"
      ],
      "6": [
        "7"
      ],
      "7": [
        "8"
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        "9"
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      "9": [
        "10"
      ],
      "10": [
        "11"
      ],
      "11": [
        "12"
      ],
      "12": [
        "13"
      ]
    }
  },
  "target_df": {
    "SID": {
      "0": [
        "1"
      ],
      "1": [
        "2"
      ],
      "2": [
        "3"
      ],
      "3": [
        "4"
      ],
      "4": [
        "5"
      ],
      "5": [
        "6"
      ],
      "6": [
        "7"
      ],
      "7": [
        "8"
      ],
      "8": [
        "9"
      ],
      "9": [
        "10"
      ],
      "10": [
        "11"
      ],
      "11": [
        "12"
      ],
      "12": [
        "13"
      ]
    }
  }
}
```

# Explore table column values































Workflows Actions **Table** More Admin

BIOL1011

## Table

+ Row + Column Views Dashboard Column statistics CSV Download

Show 10 entries Search:

	SID	email	Surname	GivenName	MiddleInitial	Gender	UOS Code	P
  	300773633	euhz6532@bogus.com	Jen	Jie	M	male	ELON3509	
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  	319549896	ttqp9766@bogus.com	Chien	Jin	Y	male	ELON3509	
  	320250819	tjxk6150@bogus.com	Tuan	Donglu	D	female	ELON3509	
  	326285587	isim6886@bogus.com	Pan	Li Na	Y	female	ELON3509	
  	330794979	olie8242@bogus.com	Chang	Lian	M	female	ELON3509	
  	352120481	ucdx8510@bogus.com	Shao	Tain	L	male	ELON3509	
  	360594548	euho9752@bogus.com	Vida	Bailey	C	male	ELON3509	
  	363393232	tdrv2640@bogus.com	Hague	Joel	K	male	ELON3509	

Showing 1 to 10 of 14 entries

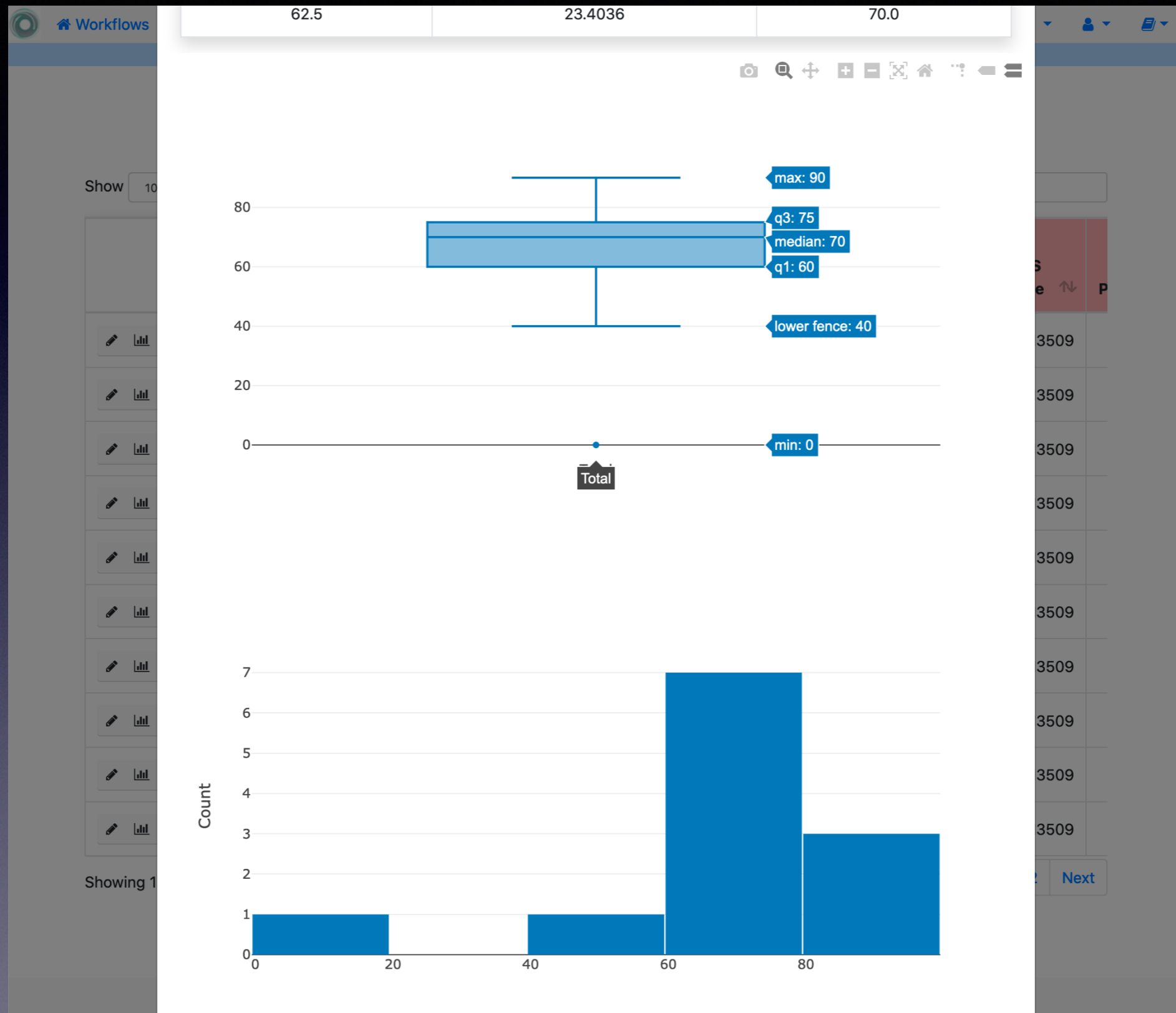
Previous **1** 2 Next

● String | ● Number | ● Boolean | ● Datetime

You may drag and drop a column header to change its position in the table

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# Explore table column values








































# ... and actions

BIOL1011

## Actions









+ Action Import actions Export actions Timeline

Show 10 entries Search:

	Name	Type	Description	Last executed
  	Badges		A badge reflecting the activity with respect to the videos	—
  	Comments about how to prepare the lecture (Week 4) 		A message commenting on the videos they watched for Week 4	—
  	Initial motivation		Motivating message depending on the program enrolled. This action sends email using the CANVAS platform	—
  	Midterm comments		Comment the midterm scores divided by topic	—
  	Project feedback		Provide feedback about the project using the results from the rubric	2019-11-04 09:49:55 +1100
  	Send JSON to remote server		Send a JSON object to a remote server (outside this platform)	—
  	Student comments Week 1		Feedback about today's lecture	—
  	Students that failed the midterm		—	—
  	Suggestions about the forum		Message to remind those students that haven't visited the forum to do so.	—

Showing 1 to 9 of 9 entries

Previous 1 Next

 Personalized Text |  Send Report |  Rubric |  Survey |  TODO List |  Personalized Canvas Email |  Personalized JSON |  Send JSON Report

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Personalised email

Personalised page

Rubric feedback

Send report

Survey (Input)






































# ... and actions

BIOL1011









## Actions

+ Action | Import actions | Export actions | Timeline

Show 10 entries | Search:

	Name	Type	Description	Last executed
  	Badges		A badge reflecting the activity with respect to the videos	—
  	Comments about how to prepare the lecture (Week 4) 		A message commenting on the videos they watched for Week 4	—
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  	Send JSON to remote server		Send a JSON object to a remote server (outside this platform)	—
  	Student comments Week 1		Feedback about today's lecture	—
  	Students that failed the midterm		—	—
  	Suggestions about the forum		Message to remind those students that haven't visited the forum to do so.	—

Showing 1 to 9 of 9 entries | Previous 1 Next

 Personalized Text |  Send Report |  Rubric |  Survey |  TODO List |  Personalized Canvas Email |  Personalized JSON |  Send JSON Report

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Personalised email

Personalised page

Rubric feedback

Send report

Survey (Input)

# Email to a subset of students (filter)

The screenshot shows the 'Update filter' dialog in the OnTask interface. The dialog has a title bar with a close button (X) and a description field containing the text: 'These are the students that haven't connected to the discussion forum yet.' Below the description, there is a section titled 'The learner will be selected if' which contains a filter rule. The rule is defined by three buttons: 'NOT', 'AND', and 'OR', with 'AND' selected. To the right of these buttons are two green buttons: '+ Add rule' and 'Add group'. Below the logic buttons, there is a rule definition: a dropdown menu showing 'Days online', a dropdown menu showing 'less or equal', and a text input field containing the number '7'. To the right of the rule definition is a red button with a white 'X' and the text 'Delete'. At the bottom right of the dialog is a blue button labeled 'Update'. The background of the application shows a navigation bar with 'Workflows', 'Actions', 'Table', and 'More' menus, and an 'Admin' menu with a gear icon, a user icon, and a document icon.



# Email to a subset of students (filter)

The screenshot shows the OnTask interface for sending an email. The top navigation bar includes 'Workflows', 'Actions', 'Table', and 'More'. The course name 'BIOL1011' is displayed in the header. The main heading is 'Suggestions about the forum'. Below this are three buttons: 'Preview', 'Save', and 'Close'. The interface is divided into three sections: 'Text', 'Select Learners (2 learners of 14)', and 'Text Conditions (0)'. The 'Text' section contains a rich text editor with a toolbar and a text area. The toolbar includes icons for bold, italic, underline, text color, background color, text alignment, list creation, link, image, video, and code. The text area contains the following content:

Dear {{ GivenName }}

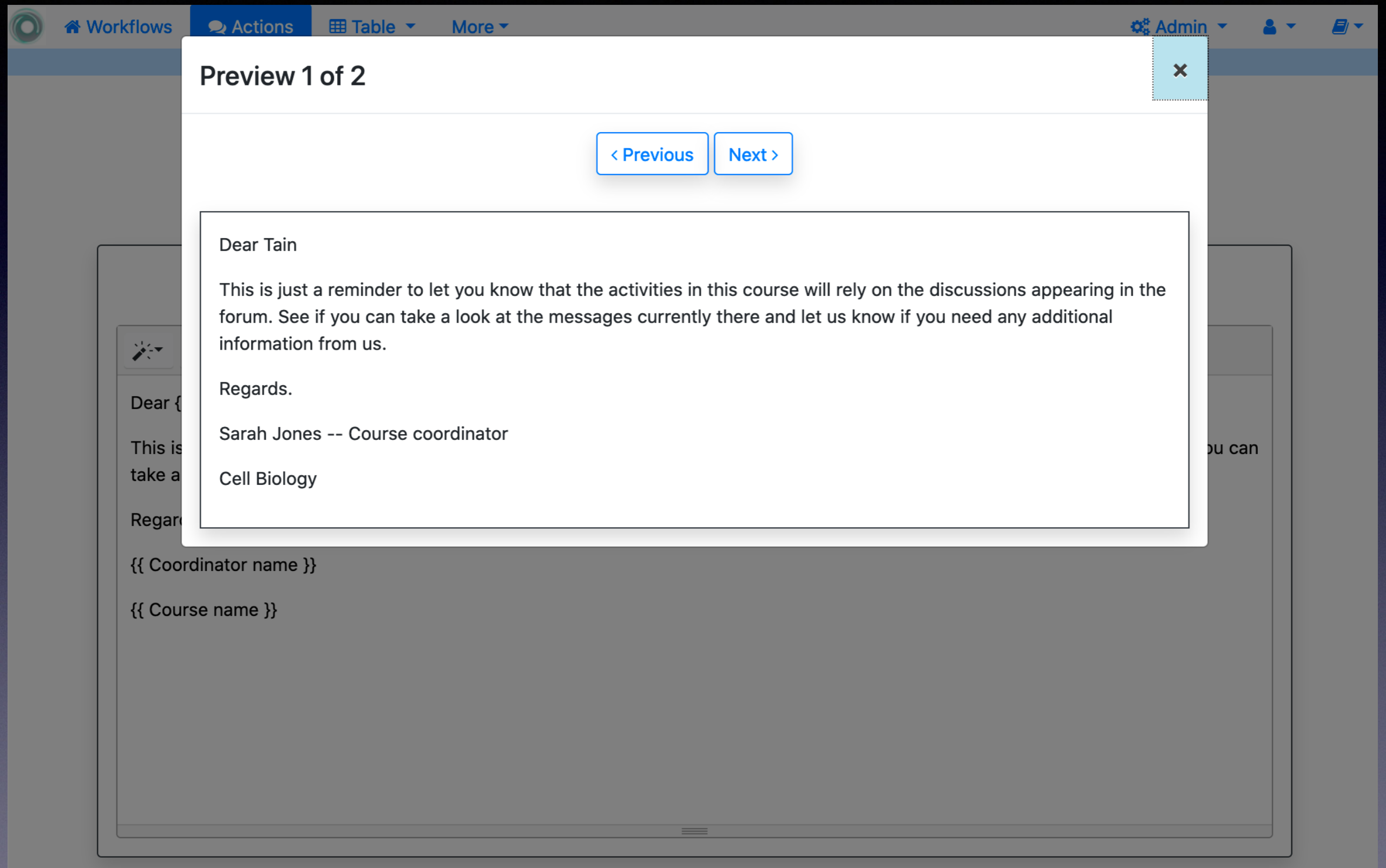
This is just a reminder to let you know that the activities in this course will rely on the discussions appearing in the forum. See if you can take a look at the messages currently there and let us know if you need any additional information from us.

Regards.

{{ Coordinator name }}

{{ Course name }}

# Email to a subset of students (filter)



The screenshot shows a software interface with a top navigation bar containing 'Workflows', 'Actions', 'Table', and 'More'. On the right, there are 'Admin' settings, a user profile icon, and a document icon. A modal window titled 'Preview 1 of 2' is open, featuring a close button (X) in the top right corner and navigation buttons '< Previous' and 'Next >' in the center. The main content of the preview is an email draft:

Dear Tain

This is just a reminder to let you know that the activities in this course will rely on the discussions appearing in the forum. See if you can take a look at the messages currently there and let us know if you need any additional information from us.

Regards.

Sarah Jones -- Course coordinator

Cell Biology

Below the preview, the email template code is visible, showing placeholders for personalization: `{{ Coordinator name }}` and `{{ Course name }}`. The background shows a blurred view of the email editor with a toolbar and a preview pane.

# Email for multiple sub-cohorts

The screenshot shows the OnTask interface for configuring an email action. The main title is "Midterm comments" under the course "BIOL1011". There are buttons for "Preview", "Save", and "Close". The interface is divided into sections: "Text", "Select Learners (12 learners of 14)", and "Text Conditions (15)".

Under "Text Conditions", there are controls for "+ Condition", "Clone other conditions", and "Column statistics". The conditions are organized into eight sub-cohorts, each with a title, learner count, description, and a formula:

Sub-cohort	Learner Count	Description	Formula
T1_HIGH	4 learners	High score in topic 1	$(Q01 = 1.0 \text{ and not empty}) \text{ AND } (Q02 = 1.0 \text{ and not empty})$
T1_LOW	2 learners	Low score in topic 1	$(Q01 = 0.0 \text{ and not empty}) \text{ AND } (Q02 = 0.0 \text{ and not empty})$
T1_MID	6 learners	One answer was correctly answered for topic 1	$((Q01 = 0.0 \text{ and not empty}) \text{ AND } (Q02 = 1.0 \text{ and not empty})) \text{ OR } ((Q01 = 1.0 \text{ and not empty}) \text{ AND } (Q02 = 0.0 \text{ and not empty}))$
T2_HIGH	6 learners	High score in topic 2	$(Q03 = 1.0 \text{ and not empty}) \text{ AND } (Q04 = 1.0 \text{ and not empty})$
T2_LOW	3 learners	Low score in topic 2	$(Q03 = 0.0 \text{ and not empty}) \text{ AND } (Q04 = 0.0 \text{ and not empty})$
T2_MID	3 learners	One answer was correctly answered for topic 2	$((Q03 = 0.0 \text{ and not empty}) \text{ AND } (Q04 = 1.0 \text{ and not empty})) \text{ OR } ((Q03 = 1.0 \text{ and not empty}) \text{ AND } (Q04 = 0.0 \text{ and not empty}))$
T3_HIGH	7 learners	High score in topic 3	$(Q05 = 1.0 \text{ and not empty}) \text{ AND } (Q06 = 1.0 \text{ and not empty})$
T3_LOW	2 learners	Low score in topic 3	$(Q05 = 0.0 \text{ and not empty}) \text{ AND } (Q06 = 0.0 \text{ and not empty})$

# Email for multiple sub-cohorts

The screenshot shows the OnTask interface for creating an email. The top navigation bar includes 'Workflows', 'Actions', 'Table', and 'More'. The course 'BIOL1011' is displayed. The main heading is 'Midterm comments'. Below this are buttons for 'Preview', 'Save', and 'Close'. The 'Text' tab is active, showing 'Select Learners (12 learners of 14)' and 'Text Conditions (15)'. The email content is displayed in a rich text editor with a toolbar. The content includes a personalized greeting, a general message about the midterm exam, and two sections: 'Chemistry and Molecules of Life' and 'Cell function and structure', each with conditional text based on student performance.

Dear {{ GivenName }}

Here are the comments about your answers to the midterm exam (ordered by topic).

### Chemistry and Molecules of Life

{% if T1\_LOW %}You need to review the concepts in this topic. It is important that you identify those molecules that are important in a living organism, and differentiate them from other molecules. Also, make sure you review the basic steps of the chemical reactions we discussed in class.{% endif %}

{% if T1\_MID %}You need to review this topic again. Make sure you easily identify which molecules are present, for example, inside a cell and differentiate them from other.{% endif %}

{% if T1\_HIGH %}Good work with this topic!{% endif %}

### Cell function and structure

{% if T2\_LOW %}Go back and review in depth this chapter. You need to be able to identify the parts of the cell, and more importantly, the role they play in the various functions. It may help to build first a table of these functions. then a table of the parts of the cell. and

# Email for multiple sub-cohorts

Workflows Actions Table More Admin

Preview 1 of 12

< Previous Next >

Dear Phoebe

Here are the comments about your answers to the midterm exam (ordered by topic).

**Chemistry and Molecules of Life**

Good work with this topic!

**Cell function and structure**

Go back and review in depth this chapter. You need to be able to identify the parts of the cell, and more importantly, the role they play in the various functions. It may help to build first a table of these functions, then a table of the parts of the cell, and then a paragraph in each category connecting one element from each table.

**Nutrition, Metabolism & Enzymes**

Good work with this block. Can you envision which metabolic processes will be affected if there are not enough nutrients reaching the cell? Can you think of any disease that is connected to these elements?

**Cell Division**

You need to review the material about mitosis and meiosis. The two processes have analogies and differences, you have to be able to analyse the steps and connect them with the other elements in the cell that participate.

**DNA Structure and Replication**

Good work with this topic. Can you identify anomalies that may appear during the replication process?

Your total score for the midterm is 60.0.

Kind regards

Sarah Jones -- Course coordinator

Cell Biology

**Values:** "Q01" = 1.0, "Q02" = 1.0, "Q03" = 0.0, "Q04" = 0.0, "Q05" = 1.0, "Q06" = 1.0, "Q07" = 0.0, "Q08" = 0.0, "Q09" = 1.0, "Q10" = 1.0



# Examples

Large, first-year undergraduate course

Use Propensity Score Matching to divide data

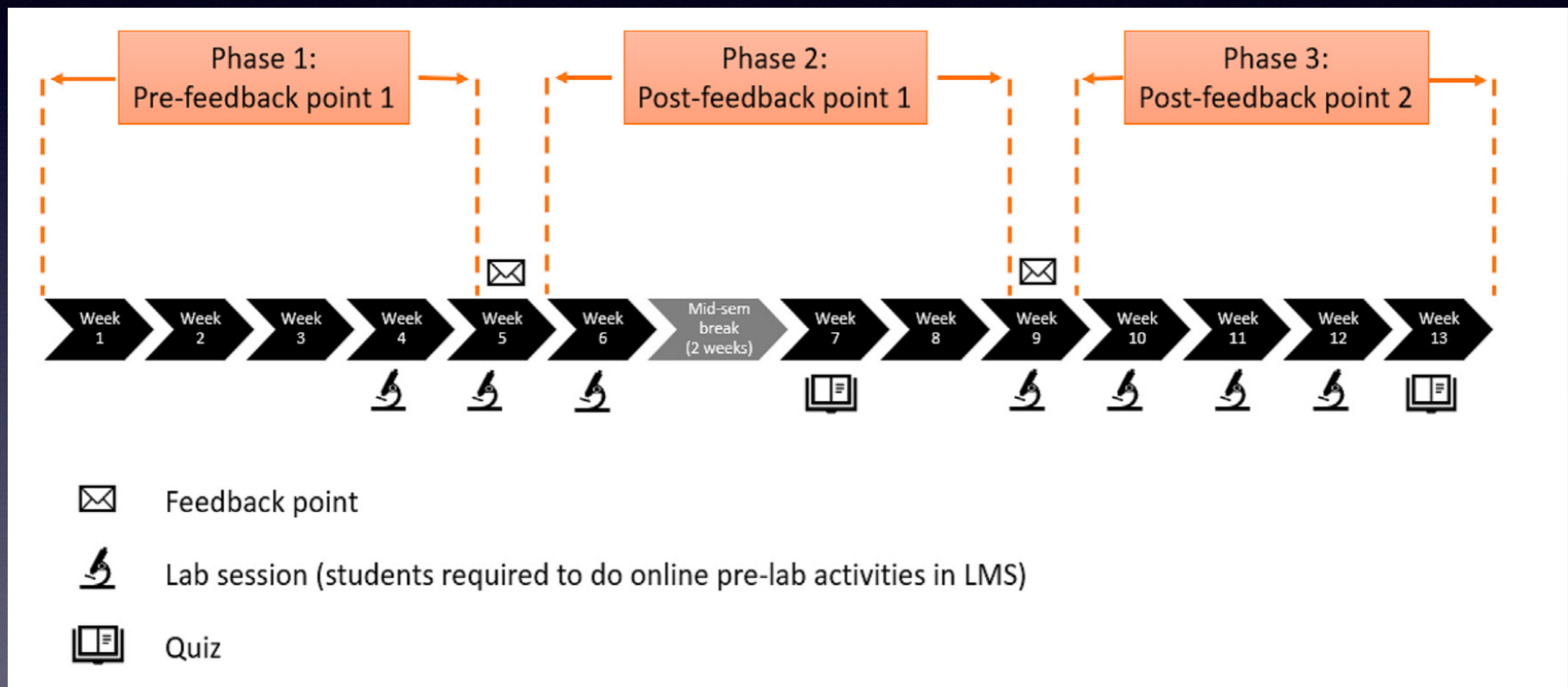
$n_{2015}=266$ : no feedback given (control)

$n_{2016}=277$ : no feedback given (control)

$n_{2017}=241$ : personalised feedback given (treatment)

Lim, L., Gentili, S., Pardo, A., Kovanović, V., Whitelock-Wainwright, A., Dawson, S., & Gašević, D. (In Press). What changes, and for whom? A study of the impact of learning analytics-based process feedback in a large course. *Learning and Instruction*. doi:10.1016/j.learninstruc.2019.04.003

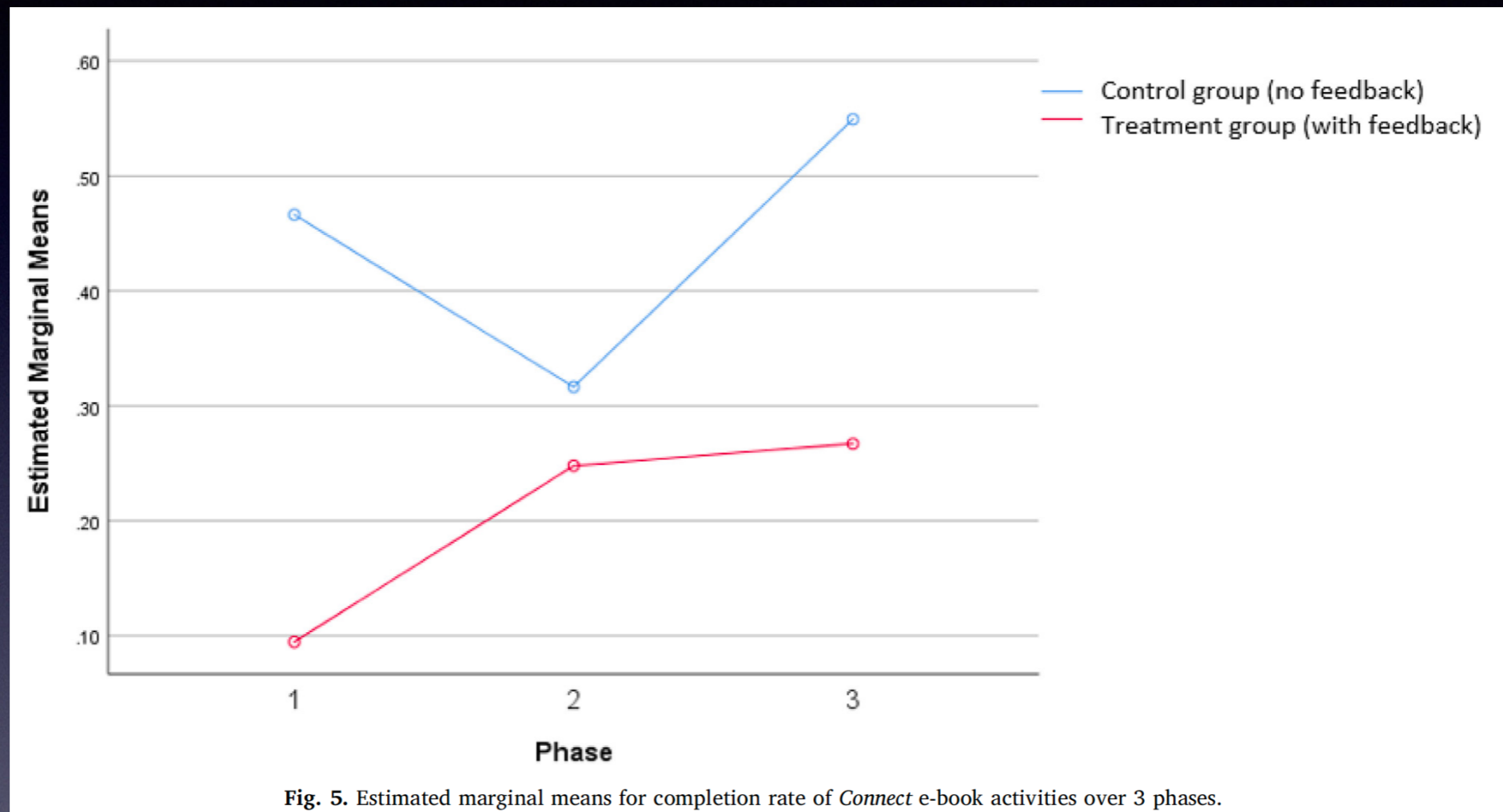
# Impact of LA-based feedback on students' self-regulated learning and academic achievement



Lim, L., Gentili, S., Pardo, A., Kovanović, V., Whitelock-Wainwright, A., Dawson, S., & Gašević, D. (In Press). What changes, and for whom? A study of the impact of learning analytics-based process feedback in a large course. *Learning and Instruction*. doi:10.1016/j.learninstruc.2019.04.003



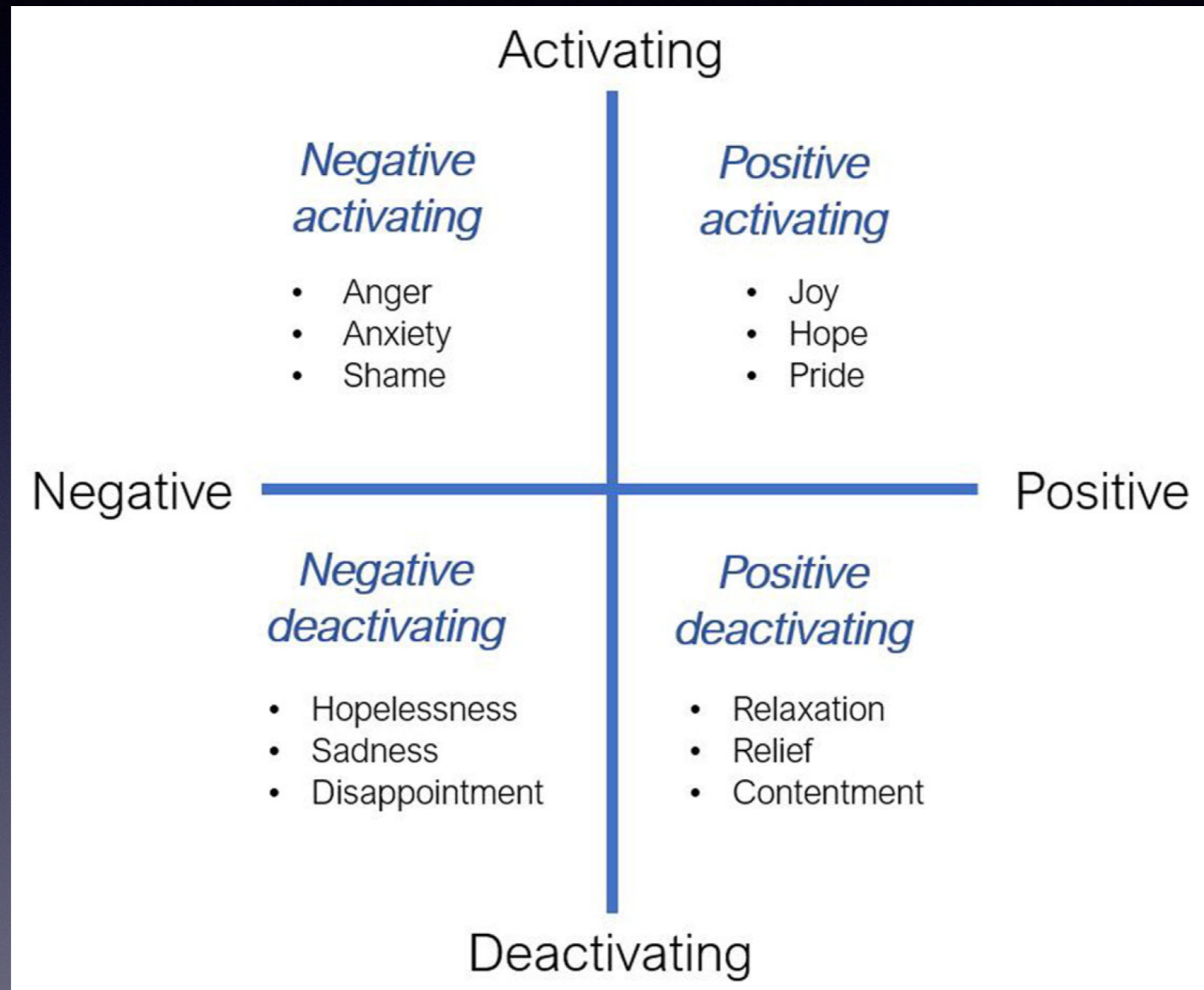
# What is the impact of LA-based, process feedback on students' (a) self-regulated learning and (b) academic performance in a course?



Difference in final course mark was strongly significant, with the treatment group achieving higher marks than the group without feedback

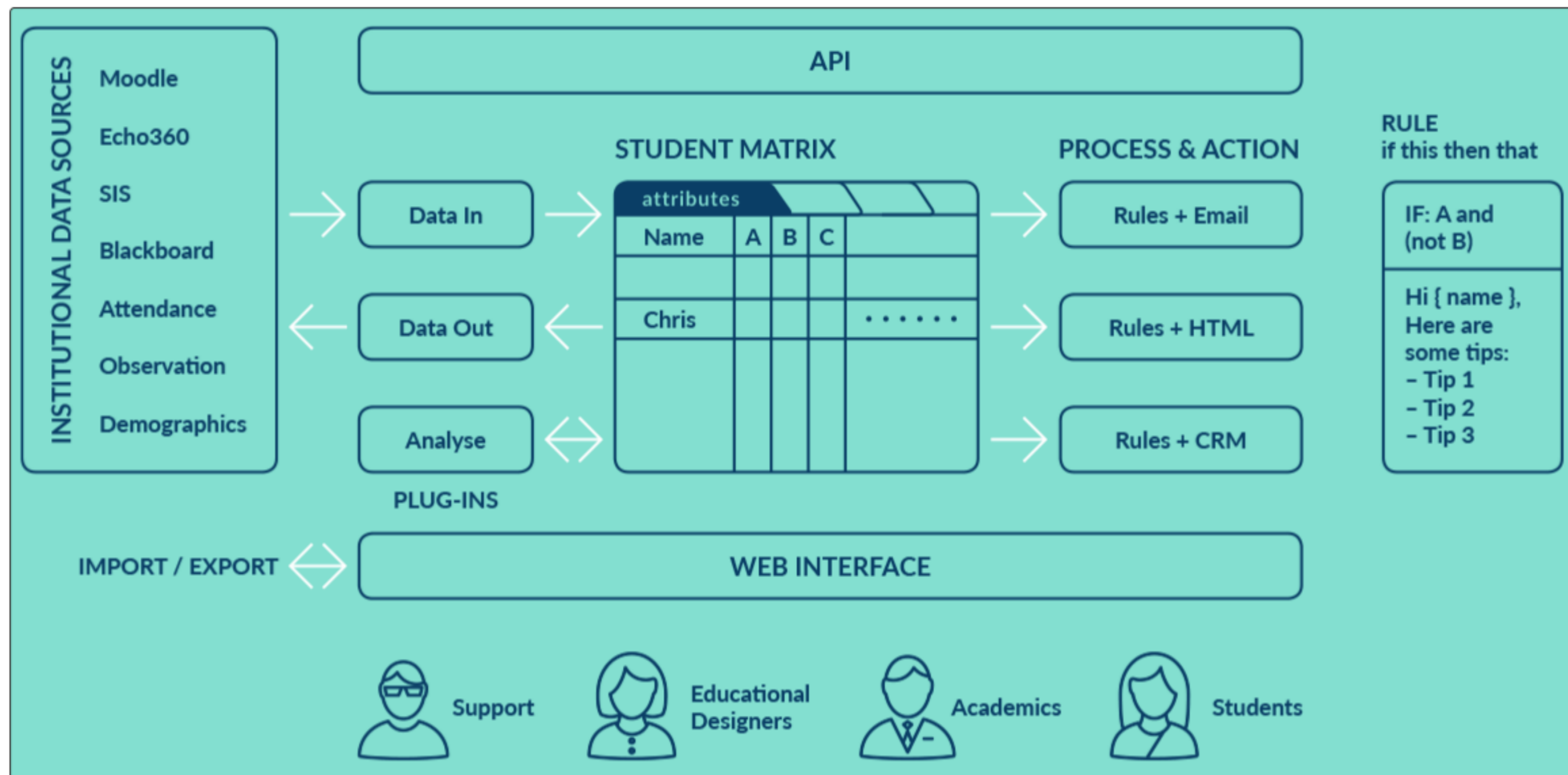
Lim, L., Gentili, S., Pardo, A., Kovanović, V., Whitelock-Wainwright, A., Dawson, S., & Gašević, D. (In Press). What changes, and for whom? A study of the impact of learning analytics-based process feedback in a large course. *Learning and Instruction*. doi:10.1016/j.learninstruc.2019.04.003

# Analysis of focus groups from four courses to understand students' sensemaking of personalised, la-based feedback.



Lim, L.-A., Dawson, S., Gašević, D., Joksimović, S., Pardo, A., Fudge, A., & Gentili, S. (2020). Students' perceptions of, and emotional responses to, personalised LA-based feedback: An exploratory study of four courses. *Assessment & Evaluation in Higher Education*. doi:10.1080/02602938.2020.1782831

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- Communication personalised based on collected data
- Scalable provision of coaching support
- Deployed and used in institutions across the world both in face to face and online courses

[ontasklearning.org](http://ontasklearning.org)

# OnTask: A tool to support the provision of personalised messages at scale



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