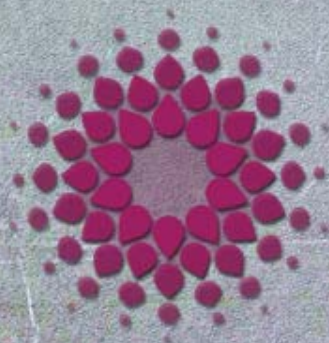


Improving the User-friendliness of AAT through a Staged Evaluation



aat

Academic
Analytics Tool

Academic Analytics Tool-AAT

The Academic Analytics Tool (AAT) allows educators without technical expertise to extract and analyse data from learning management systems to foster responsive analysis and improvement of online courses





why aat?

Online education is growing at a tremendous pace

Educators need **timely, ongoing access** to information about how students interact with online courses and learning materials

why aat?

Learning Management Systems (LMSs) store large volumes of data about how students interact with online resources

Educators need tools to **extract LMS data** to analyze student behavior and the suitability of teaching strategies and course designs





why aat?

*Current tools to access LMS data
require high technical skill, or are
too limited in scope*

Learning analysts call for
data extraction tools
**specifically designed
for educators** and learning
designers

aat is usable

**Our tool builds
complex queries using a**

***wizard
interface***

anyone can use



aat is unlimited

AAT BUILDS QUERIES
WITHOUT LIMITS

ALL DATA IN THE LMS IS
ACCESSIBLE

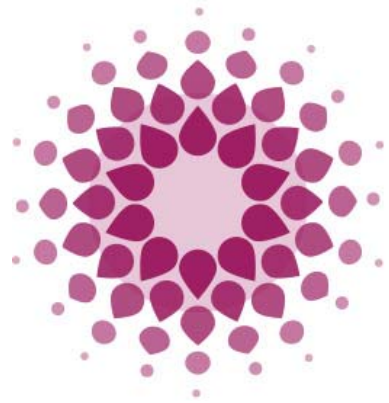
aat design

AAT uses a **customized ontology** to express database entities in terms meaningful to users without technical backgrounds



analysis
PROJECT

dataset
CONCEPTS



aat|ontology

pattern *clone* lms

CHAIN attributes

A photograph of a winter forest. The ground is covered in a thick layer of snow. The trees, including evergreens and deciduous trees, are heavily laden with snow, creating a serene and cold atmosphere. The sky is overcast and grey.

aat is unbound

**AAT aims to
work with any
LMS or database:
TEMPLATES
make it portable**

aat design

AAT templates direct
the tool to the correct
database tables and
columns for any LMS

improving usability



*The latest stage of AAT development aims to improve the **user-friendliness** of the tool*

improving aat

A **staged qualitative evaluation** on the first version of the tool focussed on AAT's user-friendliness.



improving aat

Evaluation was in two phases:

- a demo explained AAT's aim and functions
- hands-on exercises ranged from simple to complex and a solution manual helped users assess their success



improving aat

After
each phase

researchers
collected

and
analysed

user
feedback

improving aat

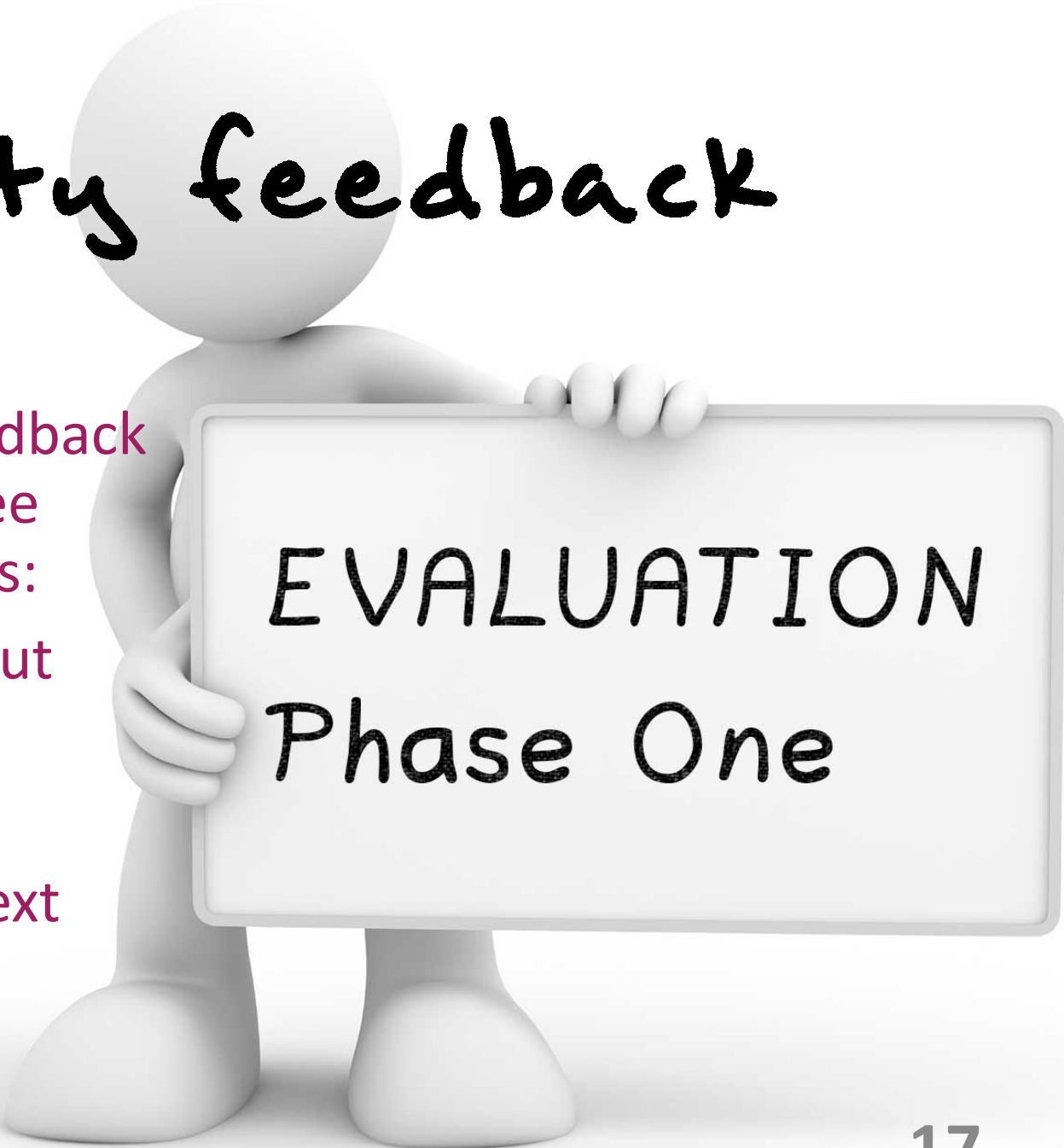


the next AAT revision
incorporated
FEEDBACK and
IDEAS
from users

usability feedback

STAGE ONE feedback
focused on three
interface factors:

- interface layout
- Concept presentation
- lack of help text



EVALUATION
Phase One

usability feedback

FEEDBACK

Users commented on general user interface aspects, noting that button positioning was unintuitive, as was the sequence of columns in the result pane.

They also suggested SQL queries should be hidden by default.

RESPONSE

AAT's user interface has been significantly improved to ensure a consistent design on all pages. SQL view can be toggled on and off.



usability feedback

FEEDBACK

Users felt the presentation of Concepts in the Pattern creation process was confusing, and offered four recommendations for improvement.

RESPONSE

The presentation of concepts has been revised based on the feedback.



usability feedback

FEEDBACK

Users asked for contextual help to make AAT's functions easier to understand.

They also suggested tweaking AAT's ontology to use more intuitive terms.

RESPONSE

We added help text to a side panel on every page, and tool tips to many buttons and selectors.

We renamed some steps so they are easier to understand (e.g., "profile" is now "project")

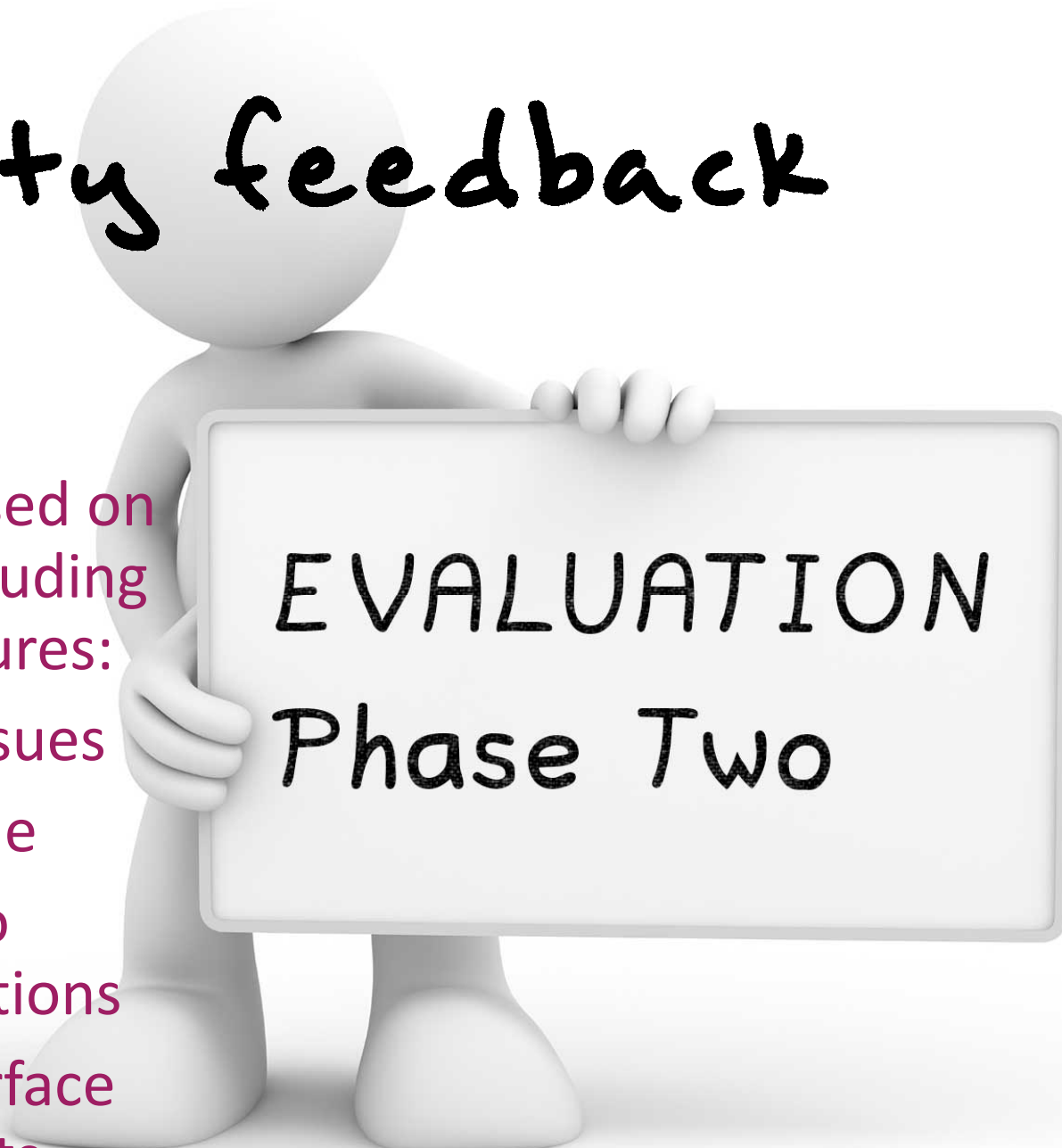


usability feedback

STAGE TWO

feedback focused on four topics including advanced features:

- navigation issues
- the user guide
- extensions to existing functions
- DataSet interface improvements



EVALUATION
Phase Two

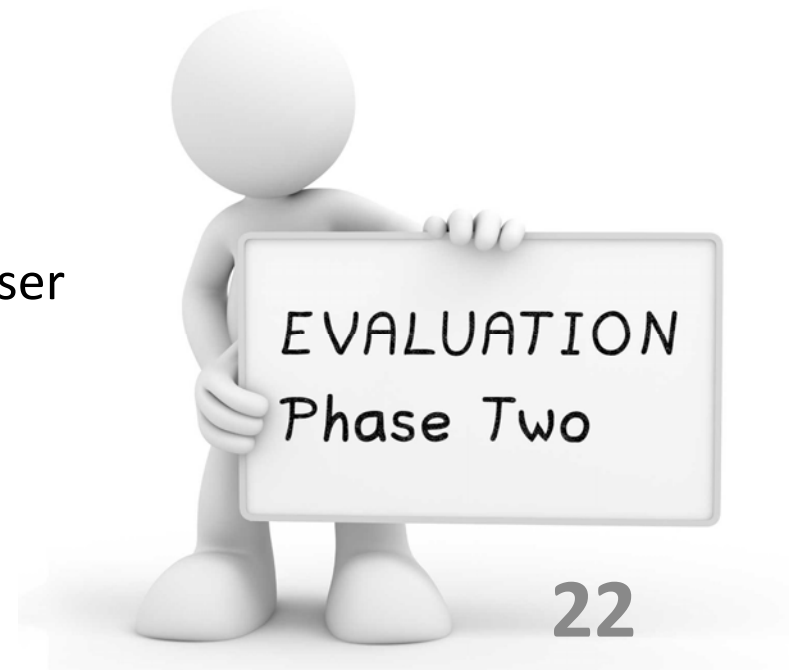
usability feedback

FEEDBACK

After our first usability update users felt pages were looking too similar and were easily confused and they critiqued the user guide and made suggestions for improvement.

RESPONSE

We have simplified some of the steps and numbered all of the pages to make it more clear where users are in the process. The User Guide has been completely updated and sample exercises are available for training sessions



usability feedback

FEEDBACK

Users made six suggestions for extensions to AAT's functionality including providing visualizations of the results, and default patterns for new users to start with.

RESPONSE

AAT is nearly ready for a full launch; new functions will be developed as we move into the next stage of revisions.



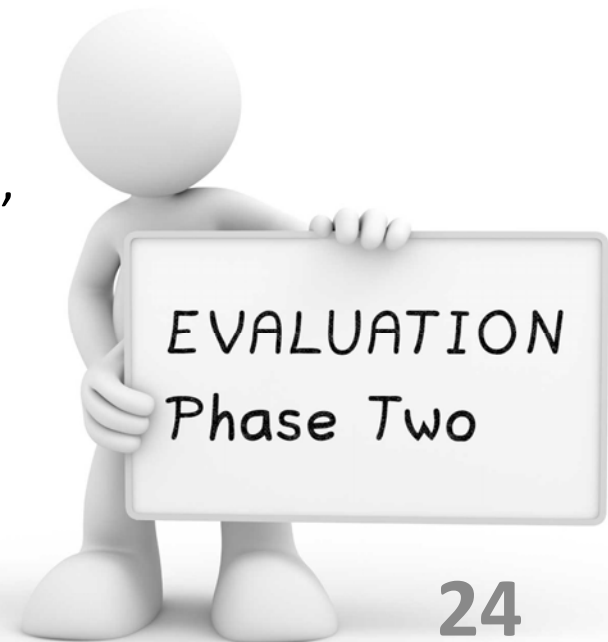
usability feedback

FEEDBACK

Users made five suggestions for improvement of the DataSet interface to make selection easier with very long lists of courses.

RESPONSE

We modified the interface to sort all courses alphabetically, rather than grouping by database, and added functionality to batch-select courses.



Completed Projects

Lists all of your completed ones
 Those in progress
 "allow you to delete a
 Project
 of
 which

This tool allows users to analyze data using this tool, please read the document

New Project ?

Name	Description
AllForumUsage	Course forum u
ENGLengagement test	English student
English_01	Test student acc
Forum usage analysis	Testing if ENGI
LearningModEffect	Effect of learnin
Sciences grades summaries	All recent grade

AAT screenshot previews

Project manager

aat | Academic Analytics Tool

Help

This page lists all of your Projects - the completed ones as well as those in progress. The "operations" allow you to run, edit, and delete a Project.

Running a completed Project will display the list of Patterns it contains, which you can run or export individually.

If the option to run a Project is not highlighted it is because it is incomplete; that is, it lacks an active DataSet, or it has no associated Pattern. To fix this, edit the Project and complete the setup process

Welcome to AAT

This tool allows users to analyze data from Learning Management Systems (LMS). If this is your first time using this tool, please read the documentation by clicking the [Help Guide](#) link in the top right menu.

Project Manager: Your Projects

New Project ?

Name	Description
AllForumUsage	Course forum usage all courses
ENGL engagement test	English student engagement
English_01	Test student access of resources in ENGL course
Forum usage analysis	Testing if ENGL students are using forums
LearningModEffect	Effect of learning modules on exam performance
Sciences grades summaries	All recent grades in science courses

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The Project Manager provides access to saved Projects and is the starting point for all AAT explorations.

Project creation

aat | Academic Analytics Tool

Help

This is where you give a name and description to your Project.

For a new Project, you will see two blank fields for the name and description.

If you are editing or Cloning a Project, the fields will be filled with the previous name and description, and you have the option to change them. For a Cloned Project you must at least change the name as you cannot save two Projects with the same name.

Back to Project Wizard Home

Step 1: Name your new Project

Project Name (*): PSYC quiz compliance

Project Description: Testing how many PSYC students are doing option

Continue to choose LMS

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A new Project begins with a name and a description.

LMS selection

The screenshot shows the AAT interface for selecting an LMS. At the top left is the AAT logo, a circular pattern of dots, followed by the text "aat | Academic Analytics Tool". Below the logo is a "Help" section with a purple header. The help text reads: "Here is the list of all Learning Management Systems (LMSs) to choose from for Project 'MATH quiz compliance.' You may only choose one LMS for each Project." To the right of the help section is a "Back" button with the text "to Project name & description". Below this is the heading "Step 2: Choose an LMS to use for Project 'PSYC quiz compliance.'" followed by a table with two columns: "Name" and "Description". The table contains one row: "Moodle 2.2" with the description "LMS for Moodle 2.2". Below the table is a "Continue" button with the text "with selected LMS". At the bottom of the page is the copyright notice "© copyright Athabasca University 2010 - 2016".

Help

Here is the list of all Learning Management Systems (LMSs) to choose from for Project "MATH quiz compliance."

You may only choose one LMS for each Project.

Back to Project name & description

Step 2: Choose an LMS to use for Project "PSYC quiz compliance."

Name	Description
<input checked="" type="checkbox"/> Moodle 2.2	LMS for Moodle 2.2

Continue with selected LMS

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A single LMS must be chosen for each project. If a given institution has more than one LMS in use, they can all be linked through AAT.

DataSet creation

Admin Home Report Issue Usage Guide Logout

Help

This page allows you to define a DataSet (a list of courses).

The courses listed come from the LMS you chose for this Project. The two top buttons provide a shortcut for selecting or deselecting all of the available courses

Back to DataSet list

Step 3a: Create new DataSet

DataSet name (*): All PSYC courses

DataSet description: All PSYC courses of all levels.

Available courses for this LMS:

TIP: To batch-select, hold shift and click the first and last courses in a range

? **Select All Courses** **Deselect All Courses**

<input type="checkbox"/>	POLI480_MAYo8	POLI
<input type="checkbox"/>	POLI480_MAYo8	POLI
<input checked="" type="checkbox"/>	PSYC 210 (C2)	Psych
<input checked="" type="checkbox"/>	PSYC 228	Celeb
<input checked="" type="checkbox"/>	PSYC 228	Psych
<input checked="" type="checkbox"/>	PSYC 228 v7	Devel
<input checked="" type="checkbox"/>	PSYC 228 v8	Devel
<input checked="" type="checkbox"/>	PSYC 289	Psych
<input checked="" type="checkbox"/>	PSYC 290 (C6)	Psych
<input checked="" type="checkbox"/>	PSYC 300	Psych

Next, a DataSet (list of courses) is built from among those available in the chosen LMS. Batch-selection options make it quick to choose a range of courses from the same subject area.

Pattern builder (a)

aat | Academic Analytics Tool

Help

Here, you can choose the concepts that will make up the base of your pattern. Concepts are all of the individual tables, or types of information, collected in the LMS system.

Later steps in the pattern creation process will allow you to perform additional processing on the Concepts, including math functions, filters, and comparisons.

Back to Patterns list

Back to wizard Home

Pattern Step A: Choosing Concepts

What concepts are you interested in?

- Centre Administrator
- Helpdesk
- Learning Service Tutorial
- Library
- Non-editing Tutor
- Course
- Resource
- Wiki
- Book
- Book Chapter
- Quiz
- Question

Patterns define the tables (Concepts) and columns (Attributes) for each investigation. Concepts are given names meaningful to educators.

Pattern builder (b)

Help

This page lists all of the Attributes for your chosen Concepts. They are grouped by Concept. If you find the wording of an Attribute to be unclear, hover your mouse over the help icon to the left and if there is an alternate description, it will pop up.

Attributes are the most specific type of data that you can select for your pattern, though as you progress through the wizard you will have opportunities to further refine your data output by applying Limits or performing Analyses.

Back to Patterns list

Back to choose Concepts

Pattern Step B: Choosing Attributes

What Concept Attributes are you interested in?

- user first access
- user id
- user id
- user last access
- user last login
- user msn
- user phone1
- user phone2
- user skype
- user timezone
- user yahoo
- username

Continue to set Limits

Sample Results

user_id	course_name
224	Psychology 345: The Psychology of Women (Rev. C3)
224	Psychology 345: The Psychology of Women (Rev. C3)
224	Psychology 345: The Psychology of Women (Rev. C3)
224	Psychology 345: The Psychology of Women (Rev. C3)

Attributes include a wide range of information stored in table cells. To help users understand the information they are selecting, a sample results window displays a few examples of each selected column.

Pattern builder (c)

Help

For each Attribute you may refine your results with a comparison function in the Limit Type column. The Limit Value column will then offer a list of Attributes for your comparison if any columns of the same data type exist. Or, you may enter a user-defined Limit.

Example: applying a "Greater Than" Limit to a Final Grades column and entering a value of 70 will limit results to those where the grade is 71% or higher.

The LIKE option performs simple pattern matching: results are filtered to include data where the chosen Attribute exactly matches the column or value selected for comparison. Note that LIKE is case-sensitive. Examples: a value of "Intro" for a course Attribute will select all courses that include Intro, with an upper case I), and those with Introduction, Introductory, etc. Searching for "Intro." with a space at the end would exclude the two longer forms of the word. % can be used as a wildcard, so

Back to Patterns list

Back to choose Attributes

Pattern Step C: Adding Limits to the Attributes

Do you want to set limits for the attributes?

CONCEPT	ATTRIBUTE	LIMIT TYPE
Course	course name	<input type="radio"/> Equals <input checked="" type="radio"/> Like <input type="radio"/> Not Like
Quiz	quiz attempts	<input type="radio"/> Less Than <input checked="" type="radio"/> Greater Than <input type="radio"/> Equals <input type="radio"/> Between
Quiz	quiz id	<input type="radio"/> Less Than <input type="radio"/> Greater Than <input type="radio"/> Equals <input type="radio"/> Between
User	user id	<input type="radio"/> Less Than <input type="radio"/> Greater Than <input type="radio"/> Equals <input type="radio"/> Between

I want **ALL** of the limits I define to apply to this pattern
OR
 I want **AT LEAST ONE** limit to apply to this pattern

Update

LIMIT VALUE **USER DEFINED VALUE**

As a final step, a Pattern can be given Limits – functions that filter data for more precise results.

Pattern manager

The screenshot shows the Pattern Manager interface. At the top right, there are navigation links: Admin, Home, Report Issue, Usage Guide, and Logout. A success message at the top states: "Your Pattern was successfully created and saved. You can now choose this Pattern or any other Pattern and go to the next step." Below this is a "Back" button with the text "to choose DataSet". The main heading is "Step 4: Choose, edit, or create a Pattern for Project 'PSYC quiz compliance.'" Below the heading is a "Create New Pattern" button with the text "and access options to Clone, Chain, or Analyze". There are "Select All" and "Deselect All" buttons with a help icon. A table lists patterns with columns for NAME, DESCRIPTION, and OWNER. The "PSYC quiz compliance" pattern is selected. At the bottom is a "Continue" button with the text "with selected Patterns".

Help

This page lists all your Patterns and any public Patterns created by other users.

The Operations allow you to Rename, Clone, Edit or Delete a Pattern (deletion cannot be undone.) To Edit a public Pattern, you must first clone it to create a copy.

Click a Pattern name to run it and see its results, or select one or more Pattern checkboxes and "Continue" to view more information and access export options.

The "Create New Pattern" button takes you to options to Clone, Chain, or Analyze Patterns.

Admin **Home** **Report Issue** **Usage Guide** **Logout**

! Your Pattern was successfully created and saved. You can now choose this Pattern or any other Pattern and go to the next step.

Back to choose DataSet

Step 4: Choose, edit, or create a Pattern for Project "PSYC quiz compliance."

Create New Pattern and access options to Clone, Chain, or Analyze

Select All **Deselect All** **?**

	NAME	DESCRIPTION	OWNER
<input type="checkbox"/>	Course module effect	Effectiveness of course modules on quizzes	Tam Ross
<input type="checkbox"/>	ENGL 255 with resource name new and old		Tam Ross
<input checked="" type="checkbox"/>	PSYC quiz compliance	All students with more than one attempt in a PSYC quiz	Tam Ross
<input type="checkbox"/>	QuizPerformance	Student performance in PSYC quizzes	Tam Ross
<input type="checkbox"/>	Student Exam Performance ENGL	Performance on all exams by English students	Tam Ross

Continue with selected Patterns

After completing a Pattern, users return to the Pattern Manager where they can access additional functions (e.g., analytical functions) or select a Pattern to view details and results.

Project details

new Pattern or run additional functions (such as Chaining or an Analysis), or you can return to the Project list to select or create an entirely new Project.

Selecting Run Project will generate your final output and provide you with links to export or view the results in HTML, XML, or CSV format.

Info about Profile "PSYC quiz compliance"

Here is a summary of the information included in the profile you just created: **PSYC quiz compliance**. You can go back to the Project Manager (home page) to see all of your Projects, or you can run the active pattern for that Project right away.

Profile Info

- Data Source Name PSYC quiz compliance
- Data Source Description Testing how PSYC students use PSYC external systems

LMS Info

- Active LMS Moodle 2.2

DataSet(s) Info

- **Data Set No. 1**
 - Data Set Name All PSYC
 - Description All PSYC
 - Data Set Courses PSYC 210, PSYC 290, PSYC 305, PSYC 315 (A3), PSYC 333, PSYC (C5), PSYC (C4), PSYC (C7), PSYC 395, PSYC 401 (C3), PSYC (C4), PSYC 450, PSYC 460, PSYC (Rev. C7), PSYC 476 (Rev. C5), PSYC (Rev. C4)

Full details of each Project are available for viewing to remind users of their selections and for the convenience of other users accessing public Patterns.

Project manager

Pattern SQL Statement(s):

```
Array
(
    [119] => SELECT mdl_user.id AS user_id, mdl_course.fullname AS course_name, mdl_quiz.attempts AS
quiz_attempts, mdl_quiz.id AS quiz_id, mdl_course.id AS course_id FROM mdl_quiz JOIN mdl_course ON (mdl_quiz.course = mdl_course.id)
DISTINCT (mdl_quiz.userid, mdl_quiz.roleid, mdl_quiz.contextid) AS mdl_quiz_attempts, mdl_role_assignments, mdl_role, mdl_context
WHERE mdl_role_assignments.roleid IN (13,14,2,15,17,5,27,9,23,24,3,4,7,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100) AND
mdl_role_assignments.userid = mdl_user.id AND mdl_role_assignments.roleid = mdl_role.id AND
mdl_role_assignments.contextid = mdl_context.id AND mdl_course.id = mdl_quiz.course_id AND mdl_quiz.course = mdl_course.id AND mdl_course.id IN (85, 25, 59, 129, 2, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 100) AND ( mdl_quiz.attempts > 1)

    [118] => SELECT mdl_user.id AS user_id, mdl_course.fullname AS course_name, mdl_quiz.attempts AS
quiz_attempts, mdl_quiz.id AS quiz_id, mdl_course.id AS course_id FROM mdl_quiz JOIN mdl_course ON (mdl_quiz.course = mdl_course.id)
DISTINCT (mdl_quiz.userid, mdl_quiz.roleid, mdl_quiz.contextid) AS mdl_quiz_attempts, mdl_role_assignments, mdl_role, mdl_context
WHERE mdl_role_assignments.roleid IN (13,14,2,15,17,5,27,9,23,24,3,4,7,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100) AND
mdl_role_assignments.userid = mdl_user.id AND mdl_role_assignments.roleid = mdl_role.id AND
mdl_role_assignments.contextid = mdl_context.id AND mdl_course.id = mdl_quiz.course_id AND mdl_quiz.course = mdl_course.id AND mdl_course.id IN (3, 93, 142, 4) AND (
```

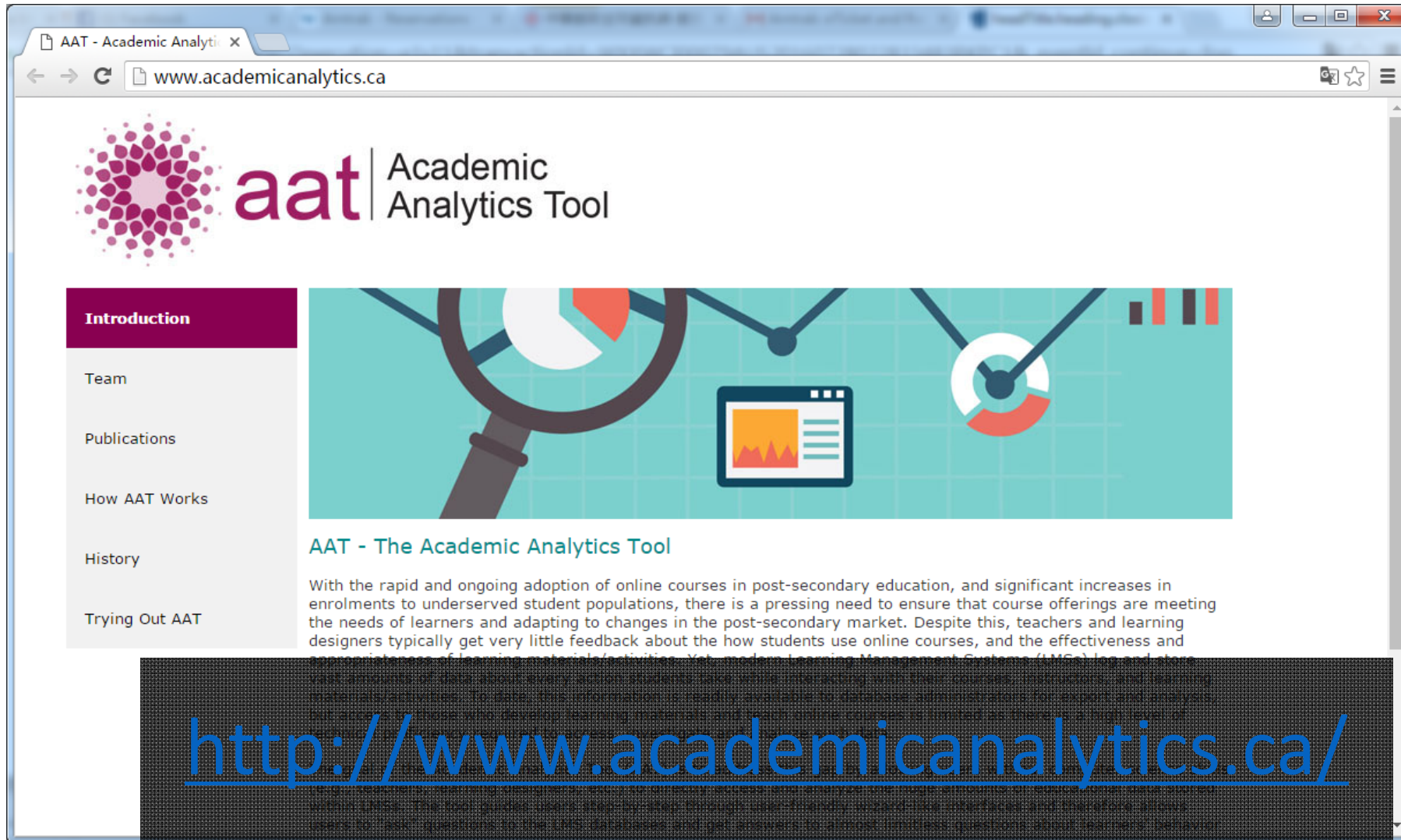
Full Results for Pattern2 "PSYC quiz compliance".

Show entries

user_id	course_name	quiz_attempts
3	Psychology 290: General Psychology (C6)	2
3	Psychology 290: General Psychology (C6)	2
3	Psychology 290: General Psychology (C6)	2
3	Psychology 290: General Psychology (C6)	2

The results of a Project can be output to HTML, XML or PDF table format, or they can be viewed in a live table on screen with options for simple filtering and sorting. The output screen also shows the SQL statement.

More information of AAT

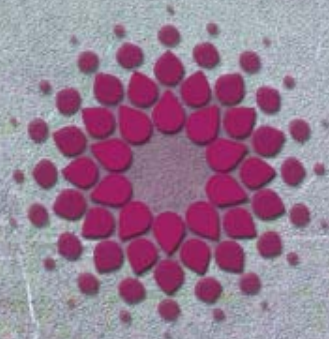


The screenshot shows the homepage of the Academic Analytics Tool (AAT) website. The browser address bar displays "www.academicanalytics.ca". The page features a navigation menu on the left with the following items: Introduction (highlighted in purple), Team, Publications, How AAT Works, History, and Trying Out AAT. The main content area includes a header with the AAT logo and the text "Academic Analytics Tool". Below the header is a large banner image with a teal background, featuring a magnifying glass over a pie chart, a laptop displaying a line graph, and a circular gauge. The banner is titled "AAT - The Academic Analytics Tool" and contains the following text: "With the rapid and ongoing adoption of online courses in post-secondary education, and significant increases in enrolments to underserved student populations, there is a pressing need to ensure that course offerings are meeting the needs of learners and adapting to changes in the post-secondary market. Despite this, teachers and learning designers typically get very little feedback about the how students use online courses, and the effectiveness and consistency of learning materials/activities. Yet modern Learning Management Systems (LMS) based systems..."

<http://www.academicanalytics.ca/>

Improving the User-friendliness of AAT through a Staged Evaluation

-- END --



aat

Academic
Analytics Tool