# Drop-out prediction from digital learning for retention

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**Goal:** identify study program specific dropout factors in the Medialogy BSc and identify the risk group
**Purpose:** allocate recourses to the at risk students within the first year or as early as possible.

## CURRENT RETENTION RESOURCES AT AAU

**The traffic light model ("trafiklysmodel")**
QlikView report for targeting failing students:
Green (no risk) [ 0, 5 [ ECTS-points behind
Yellow (at risk) [ 5, 15 [ ECTS-points behind
Red (high risk) [ 15, ∞] ECTS-points behind
**Dropout prediction (cohort 2012-2014):** not working on the first two semesters at Medialogy BSc. After the first semester every student missing any ECTS is at a 74% risk of dropping out. The model works better after the third semester.

**Student counsellors, Medialogy:** Low usage of counselling even students failing the technical courses and should have contacted a counsellor.
**Interviews:** Struggling first-year students would prefer counselling earlier in a semester rather than in the end.

## NEW RETENTION RESOURCES DESIGNED FOR MEDIALOGY BSC

**Study verification test ("studiestartsprøve", SSP):** To aid reflection on student life and growth, we informed first year students about retention factors in a questionnaire and follow-up session.
**Dropout prediction (cohort 2017):** Only the students' perceived academic ability was a significant dropout predictor for the first-year students, although we tested retention factors from other scientific work.

**Online course performancies:** We designed online course activities for the introductory programming course in the first year on Moodle, Khan Academy, and Peergrade.io.
**Course performance prediction (cohort 2017):** No strong single predictors. The midterm exam score was the strongest predictor.

## PROJECT OUTCOMES

Our **prediction results** identified various reasons to **drop out** and **fail the introductory programming exam** on the first year of Medialogy. We use the predicted risk as guidance only. To improve dropout prediction, using a variety of data to analyse student dropouts is necessary.

We **raised awareness** of the major stakeholders involved in learning analytics about the challenges in the current infrastructure and processes in place at AAU.

## DEVELOPMENT STEPS OF THE WEB APP PROTOTYPE
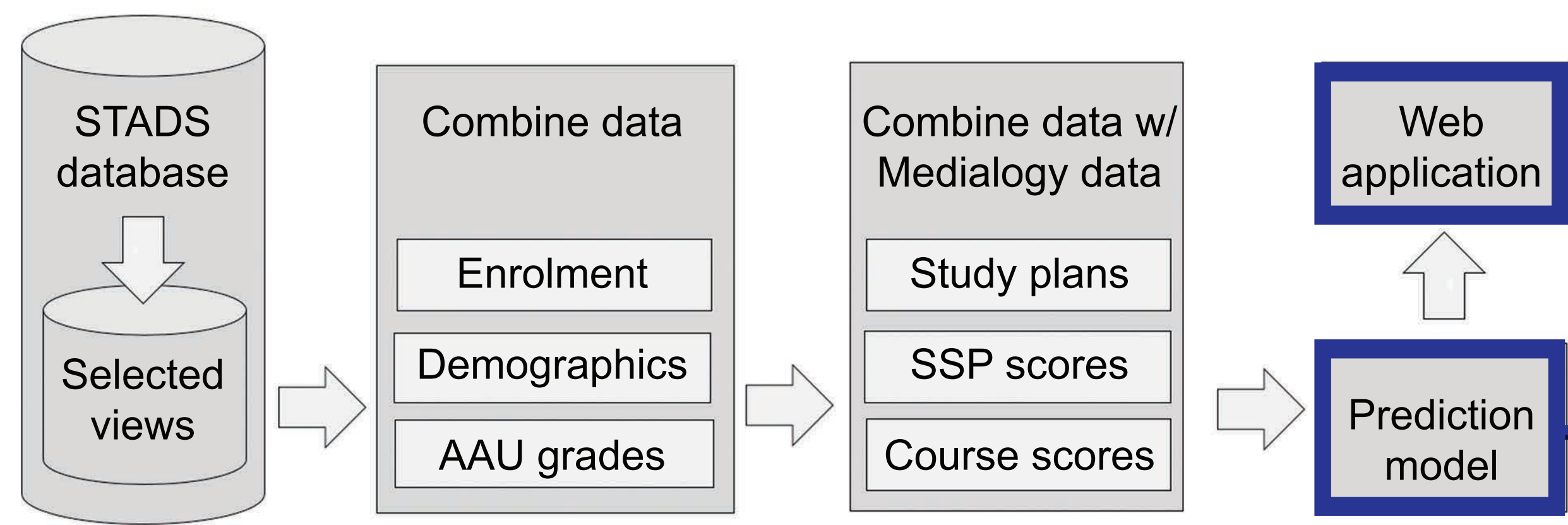


(1) Got access to selected views from STADS database.
(2) Combined the selected STADS data for all AAU students.
(3) Combined data with Medialogy BSc data.
(4) Prediction model trained on the most recent Medialogy cohort.
(5) Showed the prediction results on the web application.

## PREDICTION MODEL - TRAINED ON COHORT 2014

| Data available | | Significant predictors at the time |
|---|---|---|
| Prior enrolment | 1 | Exit math grade from qualifying education, e.g. high school. |
| After 1st sem. | 1 | Attained ECTS points in the technical course on the first semester. |
| | 2 | Semester project grade on the first semester. |
| | 3 | Grade average of the two non-techncal courses on the first semester. |
| After 2nd sem. | 1 | Attained ECTS points in technical courses on the first two semesters. |
| | 2 | Grade average of semester projects on the first two semesters. |
| After 3rd sem. | 1 | Attained ETCS points in technical courses on the first three semesters. |
| | 2 | Grade average of non-techncal courses on the first three semesters. |

*SSP scores and online course scores not available for cohort 2014.*

## WEB APPLICATION - PROTOTYPE WITH DROPOUT RISK ANALYSIS

- Displays a Medialogy BSc student's dropout risk for the selected semester and cohort.
- View individual student information and write comments saved on the web app.
- Password protected per study board.
- Dormant, working in March 2019 with fake data.

PUBLICA-TIONS

1 Identifying Students Struggling in Courses by Analyzing Exam Grades, Self-reported Measures and Study Activities. Christensen et al., Proceedings of SLERD'18: Conference on Smart Learning Ecosystems and Regional Development. Springer, 2018. pp. 167-176.
2 Pass or Fail? Prediction of Students' Exam Outcomes from Self-reported Measures and Study Activities. Christensen et al., I: Interaction Design and Architecture(s), 2019. Under review.

WEB APP DEMO

3 AAU Learning Analytics Django User Interface

bit.ly/AAU-LA