

# Learning Analytics Supported Learning Design

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## Introductie

In het Hoger Onderwijs (in Nederland) zijn de beleving van de student en de rendementen graadmeters waar instellingen op afgerekend worden. Er liggen kansen op het gebied van Learning Analytics, zelf regulerend leren en het leer ontwerp om zowel beleving als rendementen te verbeteren.

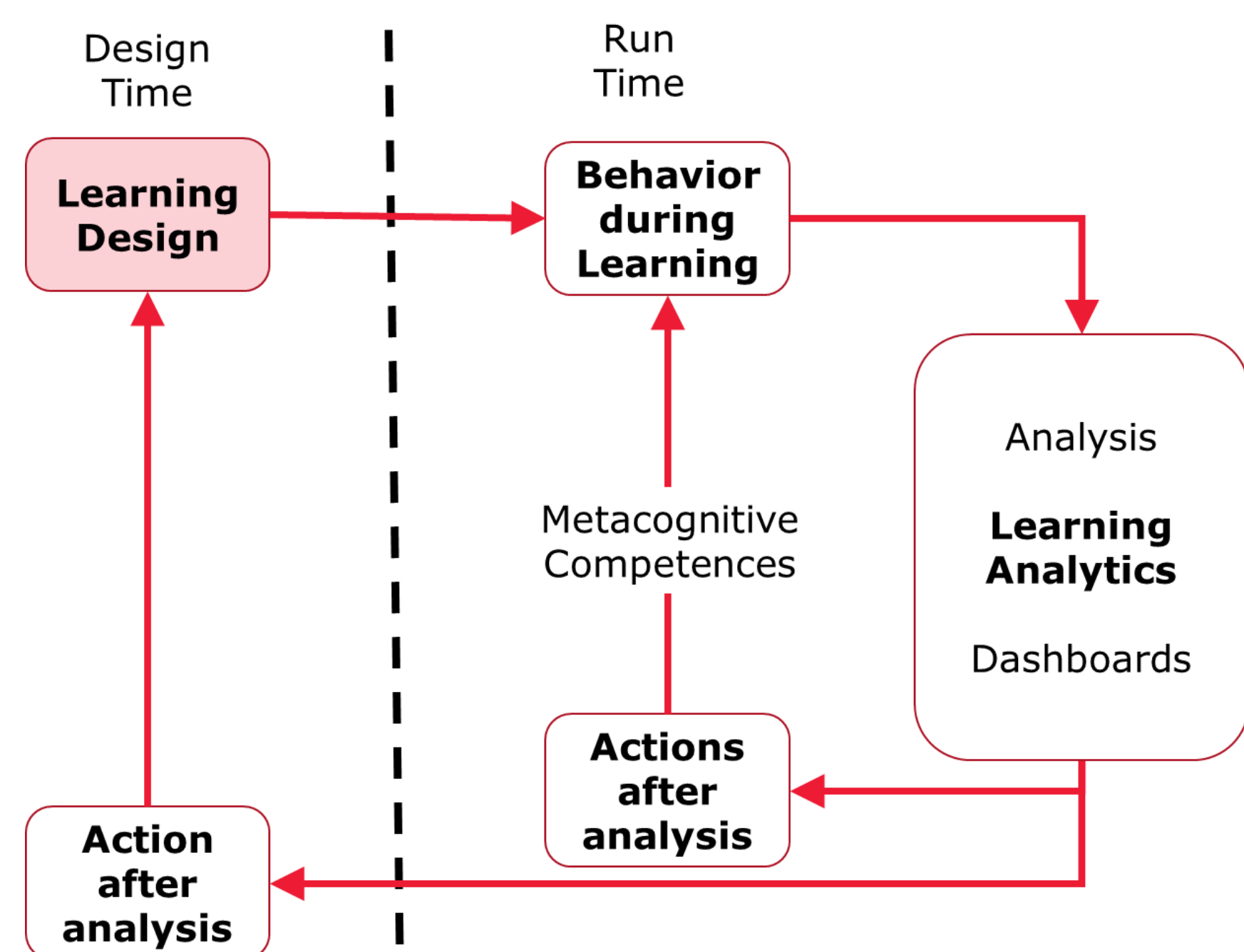
## Doelstelling (Environment)

Vergroten van beleving en efficiënter, effectiever maken van het leerproces door learning analytics gedurende een module in te zetten in relatie tot het leerontwerp.

## Onderzoeksvraag (Knowledge base)

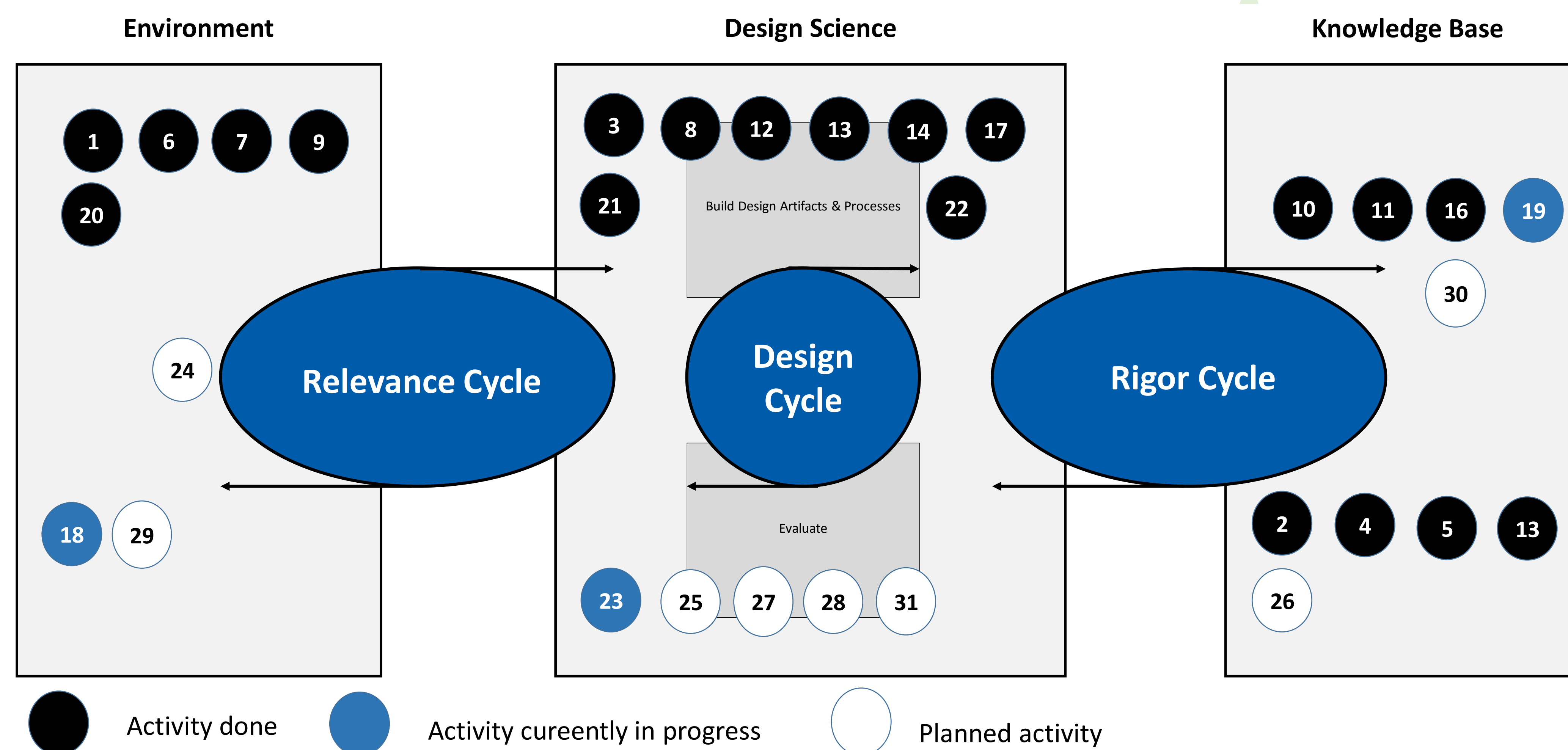
Kan de inzet van Learning Analytics, door Learning Dashboards die actief zijn gedurende de module, het ontwerp van het onderwijs verbeteren en daarmee het leerproces efficiënter, effectiever maken en de beleving van docenten en studenten vergroten?

## Ontwerp (Design)



## Methode

1. Problem Definition
  2. Conference Proceeding: "Literature review: Opportunities and Challenges"
  3. LA4LD Design v 1.0
  4. Literature review: Learning Dashboards (Data Science perspective)
  5. Literature review: Data indicators (Data Science perspective)
  6. Requirements Dashboard using Focus groups, Survey
  7. Requirements Data using Focus groups, survey
  8. LA4LD Design v 2.0
  9. Learning Design Experiment (REFLECTOR)
  10. Conference Proceeding: Investigating Relationships between MCC, Online Activity, Grades
  11. Co-author: Tracking Patterns in self regulated learning
  12. LA4LD Design v 3.0
  13. Literature Review: Data Ecosystem
  14. LA4LD Prototype Dataecosystem
  15. Goal setting and Learning Dashboards Requirements
  16. Co-author, journal: Quantum of Relevance
  17. "LA4LD version 1"
  18. "Experiment: Run-Time versus Design-Time LA4LD v1.0"
  19. Potential article: Run-Time vs. Design-Time
  20. LD2LA Interviews
  21. LD2LA v1.0. Design Process Framework
  22. LD2LA v1.0. Design Dashboard
  23. Workshop Fellowship of Learning Activities (LD2LA)
  24. Potential Conference Proceeding: "Input on LDs and Indicators using workshops at Zuyd and EC-TEL 2019"
  25. LD2LA v2.0 Design
  26. Literature Review: Learning Design Meaningful Indicators
  27. Metacognitive Competences Dashboards v1.0 Designs
  28. LA4LD Version 2
  29. "Experiment: Metacognitive competences Dashboard LA4LD v2.0"
  30. Potential article: MCC and LA4LD
  31. LA4LD Version 3
- Bachelor Thesis Student involved  
 Student population participated



## Resultaten

2. Conference Proceeding: "Literature review: Opportunities and Challenges"

Learning Design	Learning Analytics	Learning Dashboards	Metacognitive Competences	Relevance
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31				

4 t/m 7. Conference Proceeding: "Make it Personal"

Requirements	Demanded by	Data source
Personal, social, contextual condition of students	Students and teachers	Ask students
Quality of learning material	Students and teachers	Ask students
(Comparison of) usage: number of times of learning material	Students and teachers	From system
(Comparison of) usage: duration of task of learning material	Students and teachers	From system
Performance of individual in group assignments	Students and teachers	Ask students
Progress of study	Students and teachers	From system
Program of study	Students and teachers	From system
Analysis/Recommendation on study behaviour	Students and teachers	From system
Identification of possible peer assistance	Students and teachers	From system
Isolation of learning activity	Students	Ask teacher
Estimated time to finish task	Students	Ask teacher
One behaviour during learning activity	Students	Ask student
Quality of teacher	Students	Ask student
Alert systems group analysis	Teachers	From system

I1: No distinction towards Learning Design  
 I2: Because students see learning analytics as an integrated part of their online learning environment, other functionalities can stimulate them using LA  
 I3: Learning Activities are central element

I4: There is opportunity improving planning students  
 I5: Students claim to do more in less time  
 I6: Self reflection is low  
 I7: Students are prepared to share data

10. Conference Proceeding: Investigating Relationships between MCC, Online Activity, Grades

Total	n		Avg		Std	
	AG	OAS	OAS	OAS	OAS	OAS
MS	4.5	17	6.1	33.7	2.8	7.7
MS	3.5	11	7.8	29.1	2.1	5

R1: Learning Design needs measurable elements  
 R2: Take measurement into consideration at design  
 R3: Store material where it can be measured

Students with:  
 - High value metacognitive self-regulation,  
 - Have lower grades  
 - Have higher usage planning documents

L1: Students do not prepare for lectures  
 L2: Usage presentations highest during lectures  
 L3: Practice test and solution hardly used  
 L4: Self regulation and grades moderate negatively correlated  
 L5: Significant (moderate) correlations can be found

## Spin off projects

- Lecture Dashboard hololens (project in module)
- Workshop Dashboard hololens (project in module)
- Data Science on MCC, online activity, grades (project in module)
- Assignments in first and second year research modules
- Self regulated Learning Questionnaire Tool (3rd year internship)
- Student and Teacher Localisation Tool (3rd year internship)