

Towards Highly Informative Learning Analytics

Inaugural Speech given by Prof. Dr. Hendrik Drachsler 12.05.2023 – 4pm exactly Prof. dr. Hendrik Drachsler

Towards Highly Informative Learning Analytics





1. Learning Analytics

2. Highly Informative Learning Analytics (HILA)

3. Designing HILA Feedback

4. Data-enriched Learning Activities

5. Researching the effects of HILA

6. Conclusions







Data from education

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Moodle - Administration - Me	odules ► Activities					Blocks et
Site Administration	Activities					
Notifications						
Courses	Activity module	Activities	Version	Hide/Show	Delete	Settings
Location	Assignment	0	2007020200		Delete	Settings
Modules	Chat	0	2007020200	đ	Delete	Settings
Activities Blocks Elitered	2 Choice	0	2007020200	000	Delete	0.00
	E Database	0	2007022001	œ	Delete	Settings
C Security	A Porum	0	2007020202			Settings
Appearance	(2) Glossary	0	2007020200	۲	Delete	Settings
Front Page	Hot Potatoes Quiz	0	2007020202	~	Delete	Settings
Server Networking	Journal	0	2007020200	~	Delete	
Reports	LAMS	0	2007020200	~	Delete	Settings
Miscellaneous	Label	0	2007020200	100	Delete	
Search	Sh Lesson	0	2007020201	100	Delete	
	Quiz	0	2007020200		Delete	Settings
Admin bookmarks	· Resource	0	2007020200	1	Delete	Settings
bookmark this page	SCORM/AICC	0	2007070300		Delete	Settings
	G Survey	0	2007020200	(1)	Delete	
	1'T Wiki	0	2007020200	100	Delete	
	D Warkshor		2007020200		Dalata	



G Artificial Intelligence

OpenAl

MuseNet

OpenAl Codex

JALL-E2

ChatGPT

Give an introduction to the Oratie van Hendrik Drachsler

Music

Softwar

Picture

Text

The Oratie van Hendrik Drachsler, also known as the inaugural lecture of Hendrik Drachsler, is a speech that was delivered by Dr. Drachsler on the occasion of his appointment as a professor at the Open Universiteit Nederland (Open University of the Netherlands) in 2017. The oratie is a traditional academic ceremony in which a new professor delivers a lecture to mark the beginning of their tenure at the university.

Hendrik Drachsler is a prominent figure in the field of educational technology, and his oratie focused on the intersection of technology and education. In his speech, Dr. Drachsler discussed the challenges and opportunities that technology presents for education, particularly in the context of online and distance learning.

The oratie was well-received by the academic community, and it has since been widely cited and discussed in the field of educational technology. Dr. Drachsler's insights into the use of technology to support learning and teaching continue to be relevant and influential, and his oratie remains an important contribution to the ongoing conversation about the future of education.

Ġ Regenerate response

Send a message.





H Learning Analytics: New insights into learning



H Learning Analytics: New insights into learning



Our aim: Personalised feedback for our students



What our students want?

- Develop their competences
- Personal advice on skill development
- Earn ECTS points
- Get their certificate

Our reality: Very little feedback in most cases





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Gasevic et al., 2015; Jivet et al., 2017; Motz et al., 2022

G Simplification Gap of Learning Analytics



Jivet et al. (2021)

Overcoming the Technology Determinism in Learning Analytics



Gasevic et al., 2015; Jivet et al., 2017; Motz et al., 2022

Model for Highly Informative Learning Analytics

Learning Analytics (LA)

Psychometrics (PSY)

Evidence

centered

Construct

evidence

Data

Design

Usercentered Design

Construct evidence

Technology & Data



Drachsler & Goldhammer (2020)



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Highly Informative Feedback



Photo by Annika Gordon on Unsplash

Highly informative feedback goes beyond feedback on *right/wrong*, it provides correct solutions, possibilities for improvement, hints on competence development and effective learning strategies.

Knowledge base for Highly Informative Learning Analytics



Atezaz Ahmad

Designing: Highly Informative Learning Analytics



PhD by Marcel Schmitz Ekaterina Soroka Katherina Dahlmanr

	•	0		Y		
		Reflection form		Providing Feedback	Providing Feedback	
	Listing to piece of music		Machine Learning			
Piece of music		Reflection form in the learning environment system to create good music recordings.	Agonums	Feedback is provided through the learning management system.	The feedback the students received is provided through the learning management system.	Discussion with help of ML Analysis
2017,-2019,-2019 2017,-2017 2017,-2017,-2017 2017,-1,-2017,-2017,-2017	Students can listen to a simulation in the learning environment system.	Task input 🕢		Feedback to students	Feedback to teacher	
Physical presentation of piece of music.	Exploring assignment	⇒ → ≛	With the help of different machine learning algorithms the audio			The ML analysis tool
Assignment		The learning management system presents students with the next task: Make	recordings will be evaluated	The learning management system provides real-time feedback to students.	The learning management system provides real-time feedback to teacher.	provides helpful metrics teacher to discuss resu with students.
\$ → 1	Students making themselves familiar with the piece of music.	an audio recording of themselves playing the piece of music and upload it to the learning	Analysis of recording	Feedback concept 🥝	Feedback concept	Group discussion
The teacher presents a	Engagement 🕜	management system.	≞ ≓ ≞			⇒ ≓ ≇
music sheets via the learning platform and performs the piece of music as an example to		Quality of recordings	The learning management system analysis the recordings of students in real time with help of			Teacher and students discuss their results. Teacher also provides possible improvements
students.			machine learning and scores the quality of the recordings.	The learning management system provides a detailed feedback to the students per assignment: - amount	The learning management system provides a detailed feedback to the teacher for all students per	paths to students.
	Invested Time to listen to the music, downloads of the piece of music.	Microphone location, Microphone settings, Background noise- cancellation off		of uploaded recordings - improvement between uploads - amount of perfect recordings - days of recordings in a row - overall score	assignment: - amount of uploaded recordings - improvement between uploads - amount of perfect recordings - days of recordings in a row	



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Developing: Data-enriched Learning Activities (DeLA)

DeLA for Reading



DeLA for Writing



Developing: Data-enriched Learning Activities (DeLA)

DeLA for Modeling



DeLA for Collaboration



DeLA – Reading Analytics



PhD by Daniel Biedermann George Ciordas-Hertel



DeLA – Reading Analytics



PhD by Daniel Biedermann George Ciordas-Hertel



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DeLA – Text Analytics



PhD by Sebastian Gombert Sebastian Wollny



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DeLA – Text Analytics



Students Scores based on Learning Goals									
🗌 Schüler*innen 🗘	Elektrische Avg: 38%	Strahlungse Avg: 44%	Umwandlung Avg: 38%	Erklären Avg: 44%	Versuche Pl Avg: 38%	Daten Auswe Avg: 50%	Energieform Avg: 0%	Umwandlung Avg: 0%	Alle goals ∽
Peter Kahn									57%
Tom Müller									55%
Bob Boyy								_	55%
Peter Kahn									51%
Peter Kahn									49%
Bob Boyy									47%

PhD by Onur Karademir

DeLA – Collaboration Analytics



PhD by Lukas Menzel



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DeLA – Collaboration Analytics



PhD by Lukas Menzel



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DeLA – Modeling Analytics



PhD by Tornike Giorgashvili



DeLA – Modeling Analytics



Feedback to your assignment	Your assignment result					
CONTENT-BASED FEEDBACK		Funktionsweise von Technologien verstehen		teci Ko	nologische mponente soziale Prozesse mit digitalen Medien sestalten	
Amount of nodes	🔵 14 von 14	technologis Komponer	nte	Soziale Kompone	ente	
Amount of connections	🔵 15 von 13		umfasst	mast	Mit digitalen Medien	
Amount of correct labels	😑 11 von 13		Digi	tale	interagieren und	
Comparison to master solution	<mark>)</mark> 73 %	Informationen	Kompe	tenzen		
The assessment of your competences in learning activ Digital media competences of pupils	umfasst	Kritisch-reflektiver Umgang mit digitalen Medien Effektiver Einsatz digitaler Medion zum Lennon				
Function of digital competences	😑 Good	Informationen	Informationen ermo	oglicht gesellschaftlic	he	
Technological components	e Sufficient	austauschen	bewerten	Teilhabe		
Social components	😑 Good					
Media- and Information competences	Excellent	PROCESS-ORIENTE	DFEEDBACK			
			Own activity	Avg. of peer students	Avg. of peer students with correct solution	
Summary: You still have some difficulties in classifyin	Editing-Sessions	7	10	8		
components and functions of digital competences.	Time invested	2,5 hours	3,1 hours	2,3 hours		
	Good Sufficient sufficient	Results controlled	2 times	3 times	3 times	

PhD by Tornike Giorgashvili



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1. How can relevant data for the learner goals of a course be extracted from digital learning environments?

2. What is the effect of different feedback types for task and exam results?

DMiU Zeitplan neu. Stand 06.10.2022





Implementing Surveys

Preparation phase

Implementing LA and content in

Consulting pilot

Moodle

partners

Preparing

lecture/

seminar

LPQ, MDC,

LA

Instrumentdevelopment

SRL, MSLQ, FL

align scales of

psychometrics and

Preparation phase

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Training of AI









Folaier Eatiry





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Conclusions

- How can relevant data for the learner goals of a course be extracted from digital learning environments?
 Data about learning goes beyond ,normal' log-files, it requires the design of dedicated DeLA that provide information for highly informative feedback.
- 2. What is the effect of different feedback types for assignment results, exam performance, and student outcomes?
 - Our students like HILA feedback significantly more than standard feedback. However, we further have to measure the long terms effects of our feedback on study success.

Conclusions

The overall objective of HILA is to improve feedback that students and teachers receive from Learning Analytics.

Our combination of knowledge base on LA indicators, the FoLA design method, and DeLA, as well as our research design full fills this aim in a very promising manner.

Soon we will address most learning situations across disciplines and offer HILA feedback to many students, while reducing teacher time.



Measure what you value; . don't value what you can

easily measure.





Ik heb gezegd.

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