Digitalisierung als Treiber für Change Prozesse an Hochschulen

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Artificial General Intelligence (20XX)

Generative Artificial Intelligence (2022)

Artificial Intelligence Education (2019)

Adaptive learning (2015)

Digital Badges (2013)

Learning Analytics (2011)

Massive Open Online Courses (2008)

Technology-enhanced learning (2004)

Virtual Campus (2000)

Learning Management System (1999)

Virtual University (1999)

Open Learning (1995)

E-Learning (1993)

Computer-mediated learning (1990)

Computer-assisted learning (1985)

Computer-based learning (1980)

Computer-assisted instruction (1960)

Die Technik rast, die (Hochschul-)**Didaktik humpelt hinterher.**

Seel, N. M., & Ifenthaler, D. (2009). Online lernen und lehren. Reinhardt Verlag. https://doi.org/10.36198/9783838532882

Folgen wir – im Kontext der Hochschulbildung – **blind** einem nicht hinterfragten **technik-optimistischen Hype?**


Hochschulbildung berechenbar machen?
Nachhaltige digitale Transformation der Hochschulbildung?
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Hochschulbildung demokratischer gestalten?
Hochschulbildung personalisierter gestalten?

Bereitstellung von **hochwertiger tertiären Bildung** mit angemessener Finanzierung und der **Nutzung von Technologie** entwickeln, einschließlich Internet, Massive Open Online Courses (MOOCs) und anderen Modalitäten, die den *akzeptierten Qualitätsstandards* entsprechen, **um den Bildungszugang zu verbessern**.

UNESCO. (2016). *Education 2030. Incheon declaration and framework for action for the implementation of sustainable development goal 4.* UNESCO. https://uis.unesco.org/sites/default/files/documents/education-2030-incheon-framework-for-action-implementation-of-sdg4-2016-en_2.pdf

Warum sollte die *Digitalisierung der Hochschulbildung* bei der **Überwindung von Bildungsungleichheit** und **Benachteiligung** erfolgreicher sein als frühere Maßnahmen und Reformen?

Selwyn, N. (2016). *Is technology good for education?* Polity Press.

Continent	% Course participants (N)	% Forum participants (N)
North America	32% (15,481)	32% (1,145)
South America	7% (3496)	10% (372)
Europe	28% (13,412)	25% (918)
Asia	26% (12,723)	24% (879)
Africa	5% (2453)	7% (234)
Oceania	2% (1125)	2% (83)

Highest level of educational attainment	% Course participants with this level (N)	% Forum participants (N)
Some high school	2% (103)	1% (26)
Completed high school	4% (282)	3% (66)
Some college	12% (805)	10% (204)
Bachelor's degree	42% (3,050)	43% (849)
Master's/professional degree	36% (2,832)	40% (781)
Doctorate	4% (265)	3% (58)

Gillani, N., & Eynon, R. (2014). Communication patterns in massively open online courses. *The Internet and Higher Education, 23*, 18–26. https://doi.org/10.1016/j.iheduc.2014.05.004

Die Abschlussquoten reichen von 0.9 % bis 36.1 %, mit einem Medianwert von 6.5 % – wobei **Abschlussquoten von 5 % typisch sind**.

Jordan, K. (2014). Initial trends in enrolment and completion of Massive Open Online Courses. *International Review of Research in Open and Distance Learning, 15*(1). https://doi.org/10.19173/irrodl.v15i1.1651

Course title	Provider	Institution	Section A (≤ 15 pts.)	Section B (≤ 30 pts.)	Section C[a] (≤ 30 pts.)	Overall score (≤ 75 pts.)
Business Foundations	edX	University of British Columbia	14	24	18	56
Commercialization of Social Enterprises	Future Learn	Free University of Bruxelles	11	27	18	56
Operations Management	Coursera	University of Illinois	15	23	18	56
Innovation Management	Future Learn	University of Leeds	13	27	16	56
Fundamentals of Project Planning and Management	Future Learn	University of Virginia	14	22	20	56
Reputation Management in a Digital World	edX	Curtin University	14	24	16	54
Business Model Implementation	edX	Delft University of Technology	13	24	16	53
Global Impact: Cultural Psychology	Coursera	University of Illinois at Urbana-Champaign	13	22	18	53
Leading and Managing People-Centered Change	Future Learn	Durham University	11	24	18	53
Ethics for Managers	Canvas Network	Santa Clara University	14	21	18	53

Note. [a] Raw points in Section C weighted with factor 2.

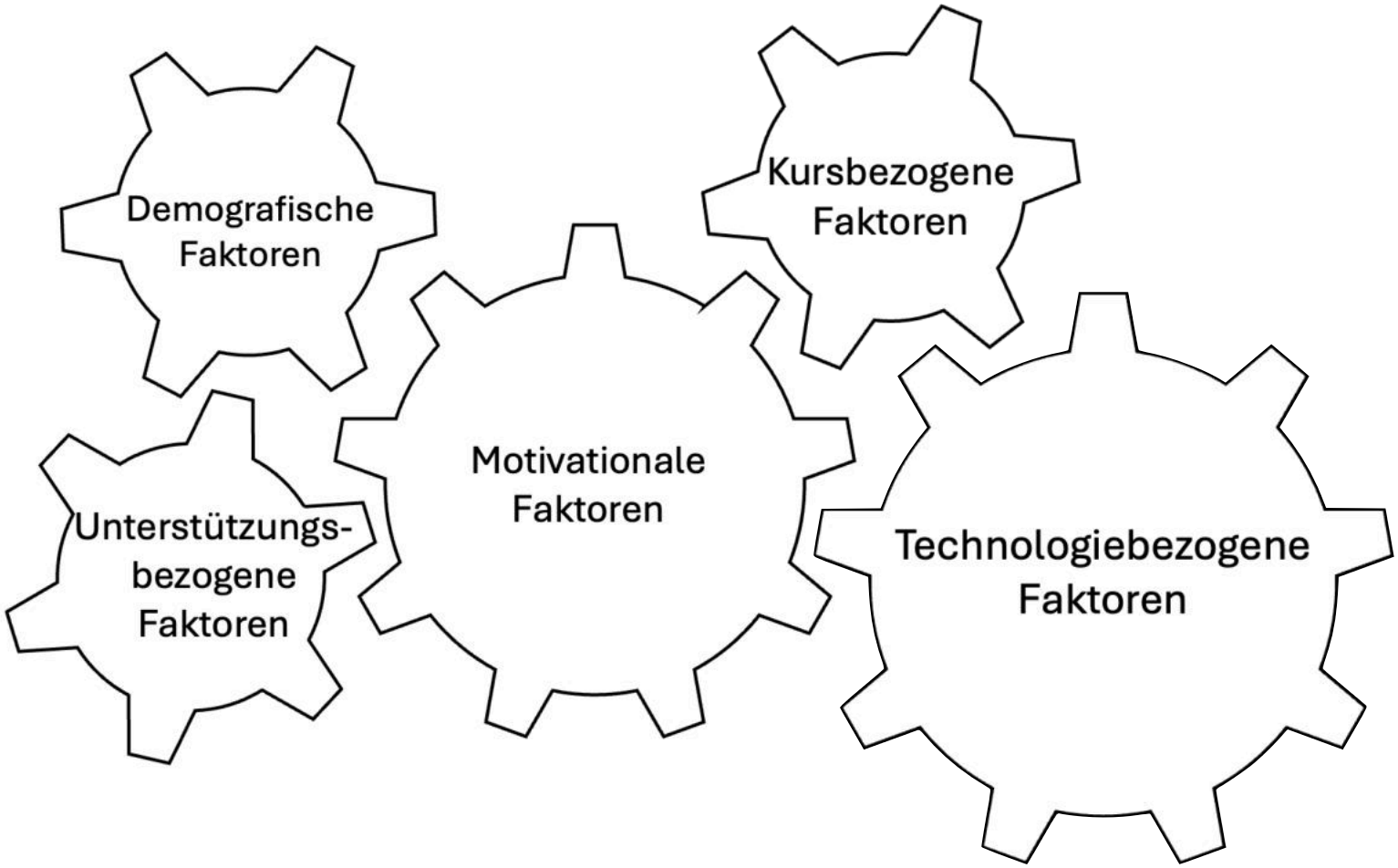
Section	(A) *M*	(A) *SD*	(B) *M*	(B) *SD*	(C) [a] *M*	(C) [a] *SD*	Total [b] *M*	Total [b] *SD*
Provider/Platform								
Canvas Network (n = 10)	12.3	1.7	17.0	3.8	13.2	4.2	42.5	8.1
Coursera (n = 25)	11.5	2.1	16.2	5.6	12.2	3.8	39.9	10.0
edX (n = 24)	12.3	2.2	18.5	4.3	13.2	2.3	43.9	6.8
FutureLearn (n = 19)	12.1	1.8	19.3	4.4	13.7	2.8	45.0	6.6
iversity (n = 8)	11.3	2.4	18.0	3.3	16.0	1.9	45.3	3.2
Open2Study (n = 10)	9.9	.3	7.5	.9	11.4	2.5	28.8	3.5
Udacity (n = 5)	8.8	1.6	9.8	4.6	8.4	3.6	27.0	9.5
F-value; η^2	3.93**; η^2 = .200		11.11**; η^2 = .415		3.94**; η^2 = .201		9.19**; η^2 = .370	
Region								
North America (n = 38)	11.7	2.4	17.2	5.2	12.3	3.8	41.3	10.0
Europe (n = 37)	11.9	1.8	17.8	4.9	14.1	2.9	43.7	7.5
Asia (n = 8)	11.1	2.6	14.1	4.9	11.8	2.9	37.0	8.8
Australia (n = 17)	10.7	1.6	12.3	6.4	12.2	2.3	35.2	9.1
Africa (n = 1)	12.0	--	16.0	--	8.00	--	36.0	--
F-value; η^2	1.050; η^2 = .042		3.795**; η^2 = .137		2.453*; η^2 = .093		3.123*; η^2 = .115	
Authoring Institution								
Academic (n = 86)	11.7	2.0	17.1	5.2	13.2	3.3	41.9	8.5
Nonacademic (n = 15)	10.7	2.4	12.2	5.9	12.2	3.3	33.9	10.6
T-value; η^2	1.659; η^2 = .027		3.266**; η^2 = .097		2.463*; η^2 = .058		3.274**; η^2 = .098	

Note. [a b] Analysis based on weighted scores.
* p < .05. ** p < .01.Í

Egloffstein, M., Koegler, K., & Ifenthaler, D. (2019). Instructional quality of business MOOCs: Indicators and initial findings. *Online Learning, 23*(4), 85–105. https://doi.org/10.24059/olj.v23i4.2091

Die **sozialen Nachteile verschwinden nicht einfach**, wenn man über das Internet lernt.

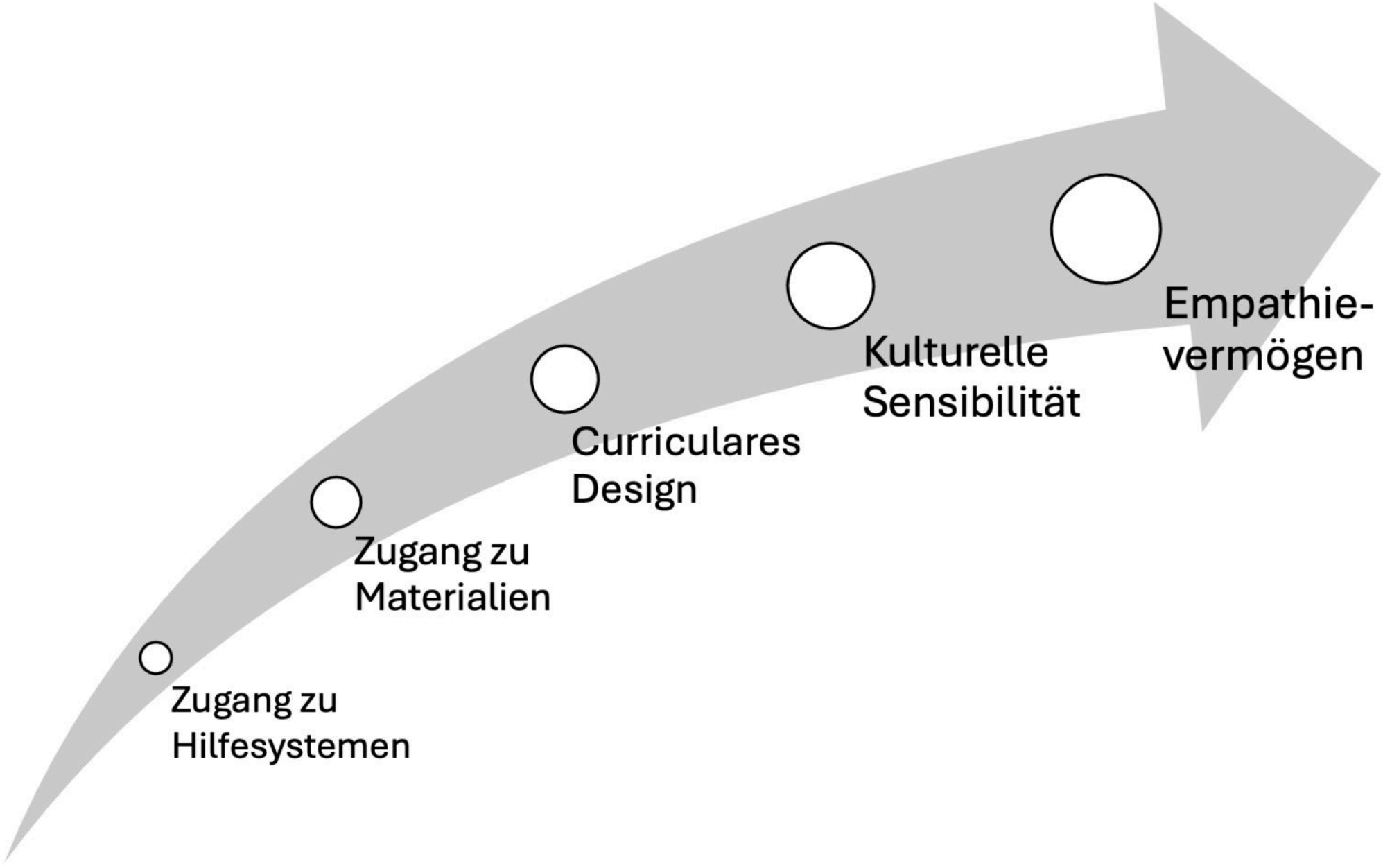
McMillan Cottom, T. (2020). Where platform capitalism and racial capitalism meet: The sociology of race and racism in the digital society. *Sociology of Race and Ethnicity, 6*(4), 441–449. https://doi.org/10.1177/2332649220949473



Rahmani, A. M., Groot, W., & Rahmani, H. (2024). Dropout in online higher education: a systematic literature review. International Journal of Educational Technology in Higher Education, 21, 19. https://doi.org/10.1186/s41239-024-00450-9

Die **soziale Ängstlichkeit von Studierenden** in digitalen Lernumgebungen an Hochschulen existiert zwischen Lernenden und Lernenden *sowie* zwischen Lernenden und Lehrenden.

Ifenthaler, D., Cooper, M., Daniela, L., & Sahin, M. (2023). Social anxiety in digital learning environments: an international perspective and call to action. *International Journal of Educational Technology in Higher Education, 20*, 50. https://doi.org/10.1186/s41239-023-00419-0



Tereshko, L. M., Weiss, M. J., Cross, S., & Neang , L. (2024). Culturally diverse student engagement in online higher education: A review. *Journal of Behavioral Education*. https://doi.org/10.1007/s10864-024-09554-8

Auf der Ebene der Beziehungen zwischen Lehrenden und Lernenden geht es darum, Dominanz durch **Dialog** zu ersetzen, Hierarchie durch **Kooperation** und **Kollegialität** sowie Passivität durch **aktives Lernen** und **Problemlösung**.

Lynch, K., & Baker, J. (2005). Equality in education: An equality of condition perspective. *Theory and Research in Education, 3*(2), 131–164. https://doi.org/10.1177/1477878505053298

Digitalisierung der Hochschulbildung kann **ein Teil der Lösung sein**, um *soziale Benachteiligung* zu überwinden, aber sie sollte **niemals als *die* Lösung** angesehen werden.

Kellner , D. (2004). Technological transformation, multiple literacies, and the re-visioning of education. *E-Learning and Digital Media, 1*(1), 9–37. https://doi.org/10.2304/elea.2004.1.1.8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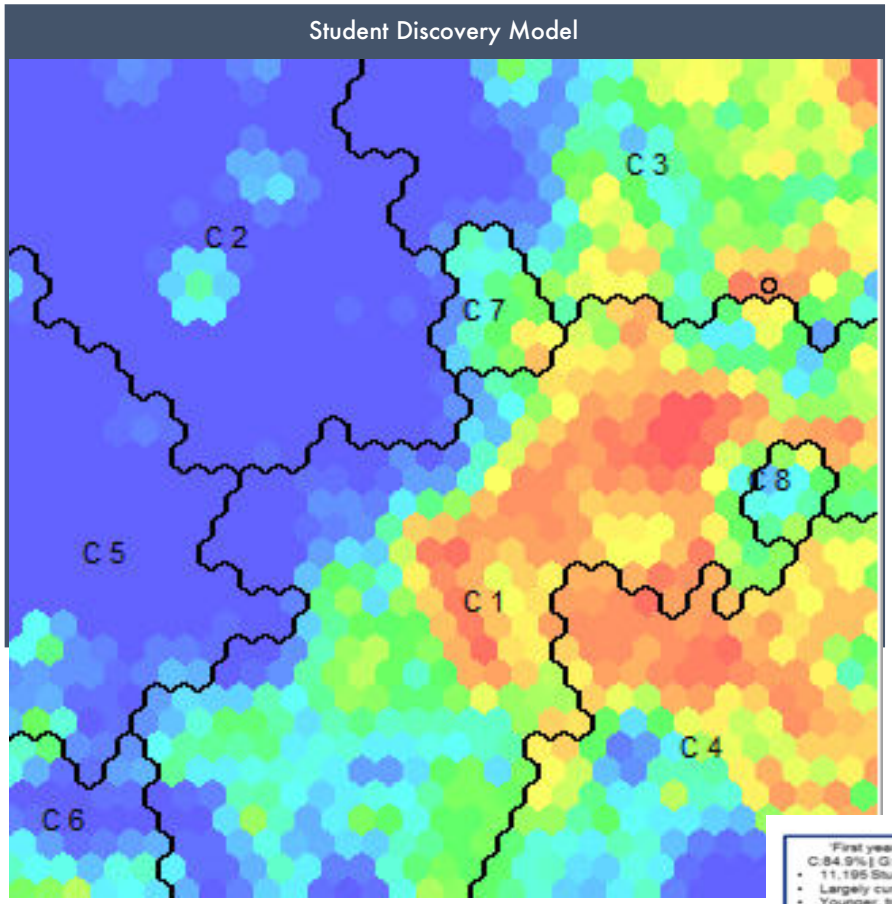
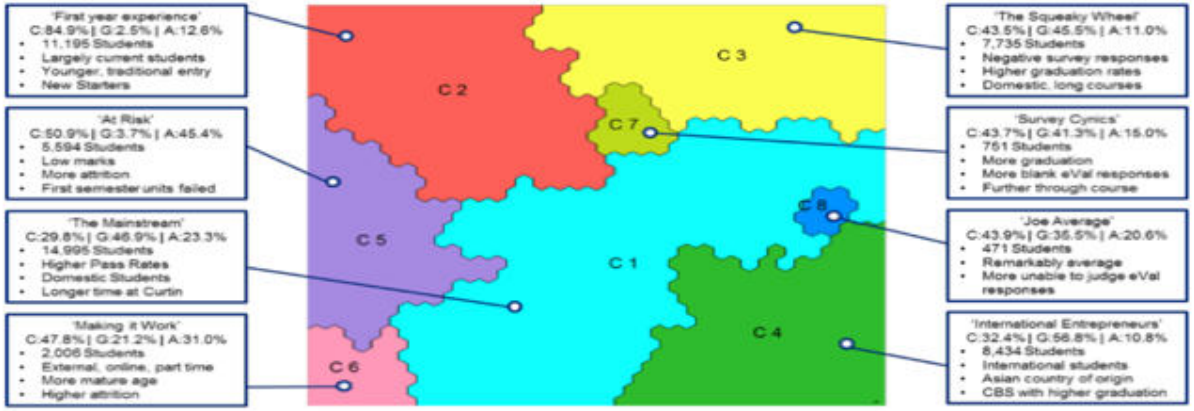
Im Gegensatz zu Menschen können **Data Analytics Ansätze** eine um vielfaches **größere Datenmengen in Echtzeit** verarbeiten.

De Laat, M., Joksimovic, S., & Ifenthaler, D. (2020). Artificial intelligence, real-time feedback and workplace learning analytics to support in situ complex problem-solving: a commentary. I*nternational Journal of Information and Learning Technology, 37*(5), 267–277. https://doi.org/10.1108/IJILT-03-2020-0026



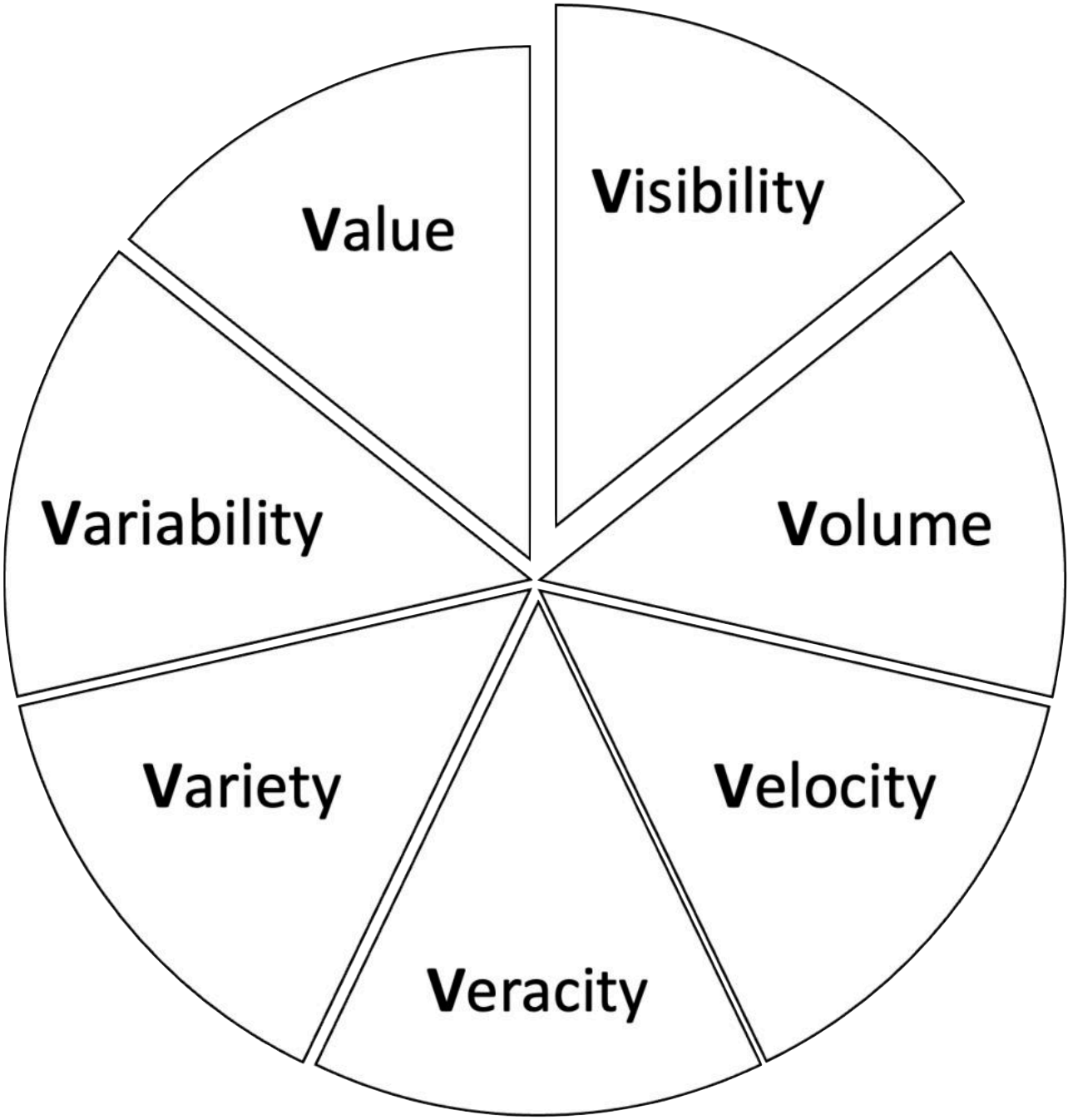
Data Analytics identifizieren **Zusammenhänge in großen Datenmengen** (Big Data), die für den Menschen nicht intuitiv zu erfassen oder zu verstehen wären, um Entscheidungen zu treffen.



Henry, M., Gibson, D. C., Flodin, C., & Ifenthaler, D. (2020). Learning innovations for identifying and developing talent for university. In D. Parrish & J. Joyce-McCoach (Eds.), *Innovations in higher education - Cases on transforming and advancing practice* (pp. 1–17). IntechOpen. https://doi.org/10.5772/intechopen.81380

Daten werden immer **aktiv produziert**, **strukturiert** und **analysiert** – Daten sind nicht einfach natürliche und wesentliche Elemente, die auf **neutrale und objektive Weise** aus der Welt abstrahiert werden.

Williamson, B., Bayne, S., & Shay, S. (2020). The datafication of teaching in Higher Education: critical issues and perspectives. *Teaching in Higher Education, 25*(4), 351–365. https://doi.org/10.1080/13562517.2020.1748811



Niculescu, V. (2020). On the impact of high performance computing in big data analytics for medicine. *Applied Medical Informatics*, *42*(1), 9–18. https://ami.info.umfcluj.ro/index.php/AMI/article/view/766

Herausforderungen für die Implementierung von Data Analytics in Organisationen sind die **Interaktion** und **Fragmentation** von Daten sowie deren **kontextuellen Eigenarten**.

Gašević, D., Dawson, S., Rogers, T., & Gašević, D. (2016). Learning analytics should not promote one size fits all: The effects of instructional conditions in predicting academic success. *Internet and Higher Education*, *28*, 68–84. https://doi.org/10.1016/j.iheduc.2015.10.002

Table 1. Student profile – comparison of institutions predicting pass/fail rates

Institution	*N*	R^2	Adjusted R^2	R^2-SVR	Predictive accuracy (SVM)
UNI1	244494	0.4635	**0.4633*** **	0.4889	**0.817**
UNI2	217039	0.4528	0.4526***	0.4603	0.796
UNI3	127218	0.431	0.4306***	0.4595	0.796
UNI4	114432	0.372	0.3716***	0.3807	0.766
UNI5	88026	0.4379	0.4374***	0.4430	0.807
UNI6	84510	0.3641	**0.3635*** **	0.3530	**0.763**
UNI7	76278	0.434	0.4334***	0.4604	0.803
UNI8	73043	0.3718	0.3711***	0.3562	0.783
SD		0.096	0.097	0.126	0.024

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Ifenthaler, D., & Widanapathirana, C. (2014). Development and validation of a learning analytics framework: Two case studies using support vector machines. *Technology, Knowledge and Learning*, *19*(1–2), 221–240. https://doi.org/10.1007/s10758-014-9226-4

Datenqualität kann nicht durch Algorithmen gelöst werden.

Ifenthaler, D. (2022). Data mining and analytics in the context of workplace learning: benefits and affordances. In M. Goller, E. Kyndt, S. Paloniemi, & C. Damsa (Eds.), *Methods for researching professional learning and development. Challenges, applications, and empirical illustrations* (pp. 313–327). Springer. https://doi.org/10.1007/978-3-031-08518-5_14

Table 2. Student profile – comparison of areas of study predicting pass/fail rates

Areas of study	*N*	R^2	Adjusted R^2	R^2-SVR	Predictive accuracy (SVM)
Arts & Humanities	386059	0.4299	0.4297	0.45039	0.799
Business	269410	0.4054	0.4053	0.4360	0.780
Education	157693	0.4887	0.4885	0.5049	0.824
Law & Justice	84663	0.4900	**0.4896**	0.5166	**0.827**
IT	57371	0.3732	**0.3726**	0.3586	**0.776**
Science & Engineering	57234	0.4228	0.422	0.4234	0.800
SD		0.107	0.107	0.129	0.027

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Ifenthaler, D., & Widanapathirana, C. (2014). Development and validation of a learning analytics framework: Two case studies using support vector machines. *Technology, Knowledge and Learning*, *19*(1–2), 221–240. https://doi.org/10.1007/s10758-014-9226-4

Jede Form der **Quantifizierung menschlicher Aktivitäten** ist notwendigerweise **reduktionistisch**.

Gourlay, L. (2024). Surveillance and datafication in higher education: Documentation of the human. *Postdigital Science and Education, 6,* 1039–1048. https://doi.org/10.1007/s42438-022-00352-x

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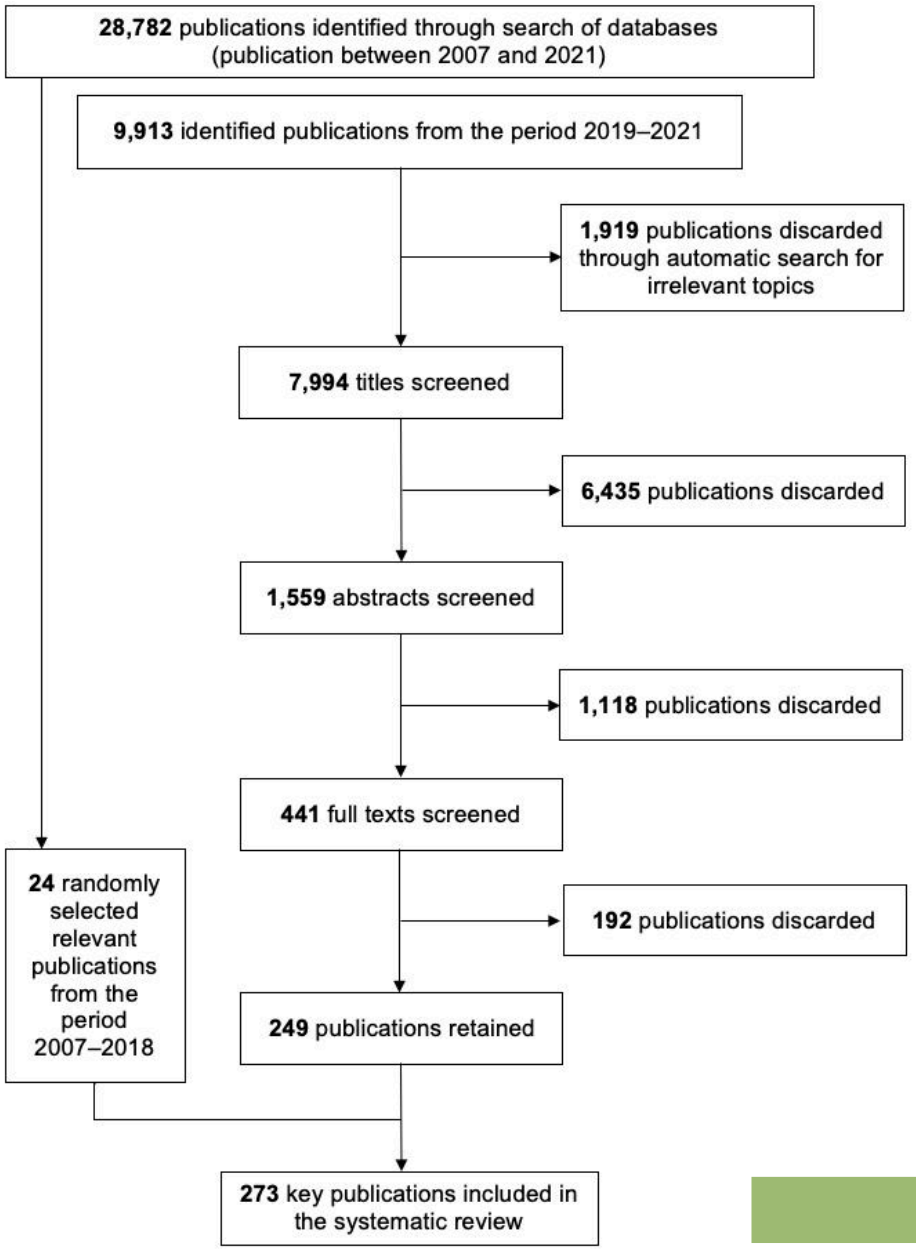
Table 2. Summary of learning analytics indicators mapped to three data profiles

	Student profile	Learning profile	Curriculum profile
Students answers/ grades	N/A	Content access (video/ audio trace data) pen trace data (self-)assessment (score, grade, completion) data	N/A
Students social learning behaviour/ engagement	Prior academic performance prior competence/skills demographic background social behaviour trait self-report survey current workload study pattern	Course access (login) content access discussion/forum (length, quality) trace data engagement trace data (self-)assessment (score, grade, completion) data	N/A
At-risk/ low-performers	Prior academic performance prior competence/skills demographic background socioeconomic background academic goals technology preparedness Completed/ withdrawn courses motivation/interest prior learning behaviour prior academic institutions enrolment history/ mode/ load	Course access (login) content access assignment submission engagement trace data discussion/forum (length, quality) trace data (Self-)assessment (score, grade, completion) data final grade reflection/ feedback access social network usage	Course characteristics course survey
Student performance	Prior academic performance demographic background socioeconomic background enrolment history/ mode/ load counselling activities psychological test outcomes	(Self-)assessment (score, grade, completion) data final grade course access content access discussion/forum (length, quality) trace data engagement trace data	N/A
Course completion	Prior academic performance demographic background completed/ withdrawn courses enrolment history/ mode/ load	Course access (login) content access discussion/forum (length, quality) trace data engagement trace data (self-)assessment (score, grade, completion) data	N/A

Yau, J., & Ifenthaler, D. (2020). Reflections on different learning analytics indicators for supporting study success. *International Journal of Learning Analytics and Artificial Intelligence for Education*, *2*(2), 4–23. https://doi.org/10.3991/ijai.v2i2.15639

Ifenthaler, D. (2021). Learning analytics for school and system management. In OECD (Ed.), *OECD digital education outlook 2021: pushing the frontiers with artificial intelligence, blockchain and robots* (pp. 161–172). OECD Publishing. https://doi.org/10.1787/d535b828-en



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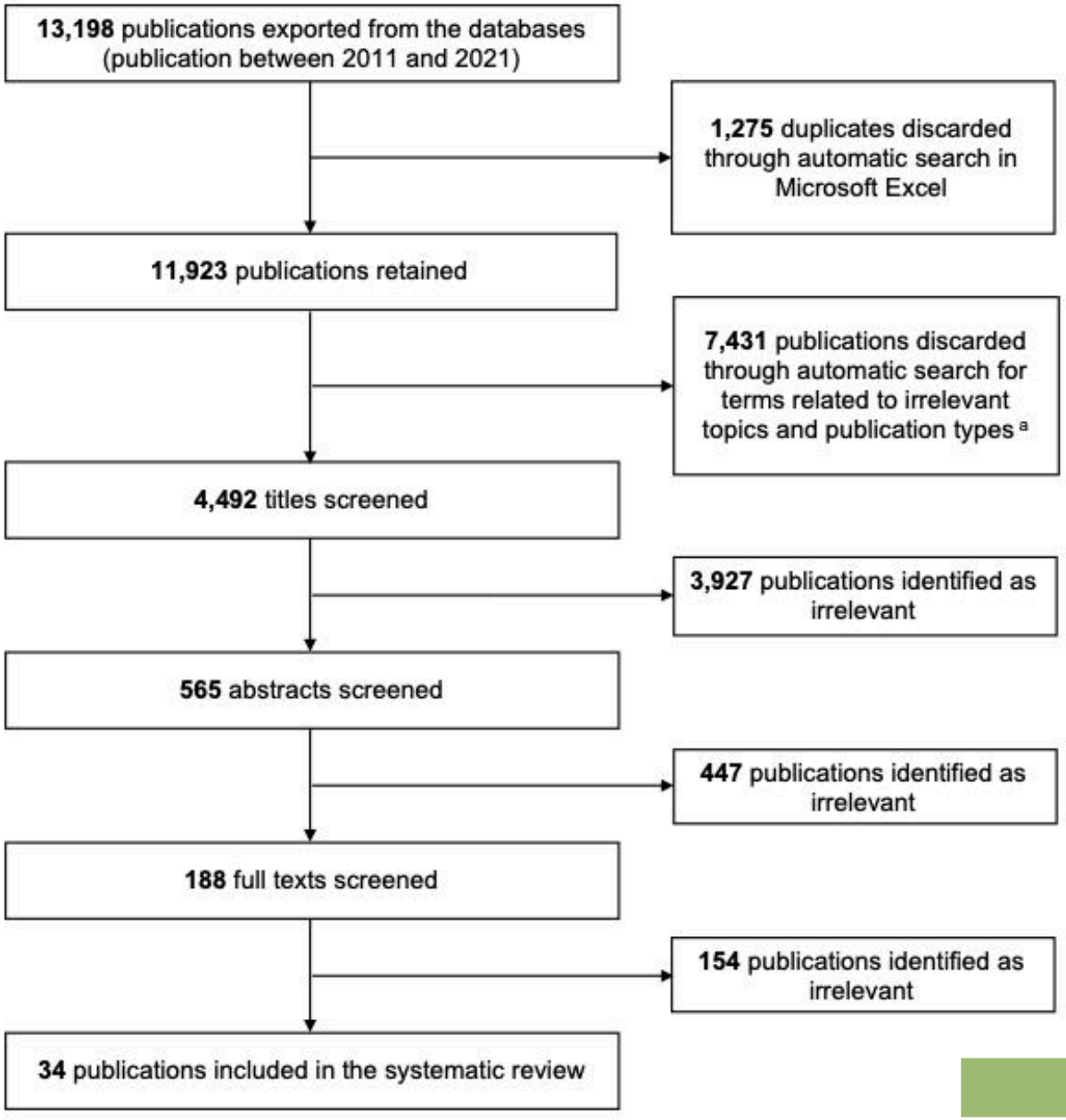
228 Indikatoren mit Fokus auf den Kontext des Lernens

Hemmler, Y., & Ifenthaler, D. (2022). Four perspectives on personalized and adaptive learning environments for workplace learning. In D. Ifenthaler & S. Seufert (Eds.), *Artificial intelligence education in the context of work* (pp. 27–39). Springer. https://doi.org/10.1007/978-3-031-14489-9_2



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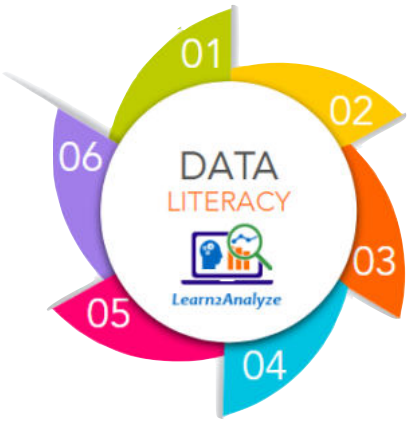
43 Indikatoren mit Fokus auf Lernergebnisse

Hemmler, Y. M., Rasch, J., & Ifenthaler, D. (2023). A categorization of workplace learning goals for multi-stakeholder recommender systems: A systematic review. *TechTrends*, *67*, 68–111. https://doi.org/10.1007/s11528-022-00777-y

Wir wissen relativ wenig darüber, wie sich die **(Lern-)Kulturen** und Prozesse an Universitäten auf die **Einführung von Datenpraktiken auswirken** können, insbesondere in Bezug auf Verwaltungsdaten.

Brooks, R., & Timms, J. (2024). Institutional constraints to higher education datafication: an English case study. *Higher Education*. https://doi.org/10.1007/s10734-024-01363-2

Co-funded by the
Erasmus+ Programme
of the European Union



Bildungsdatenkompetenz

(Educational Data Literacy) ist ethisch verantwortliches sammeln, managen, analysieren, verstehen, interpretieren und anwenden von Daten aus dem Kontext des Lernen und Lehrens.

Learn2Analyze

Papamitsiou, Z., Filippakis, M., Poulou, M., Sampson, D. G., Ifenthaler, D., & Giannakos, M. (2021). Towards an educational data literacy framework: enhancing the profiles of instructional designers and e-tutors of online and blended courses with new competences. *Smart Learning Environments*, *8*, 18. https://doi.org/10.1186/s40561-021-00163-w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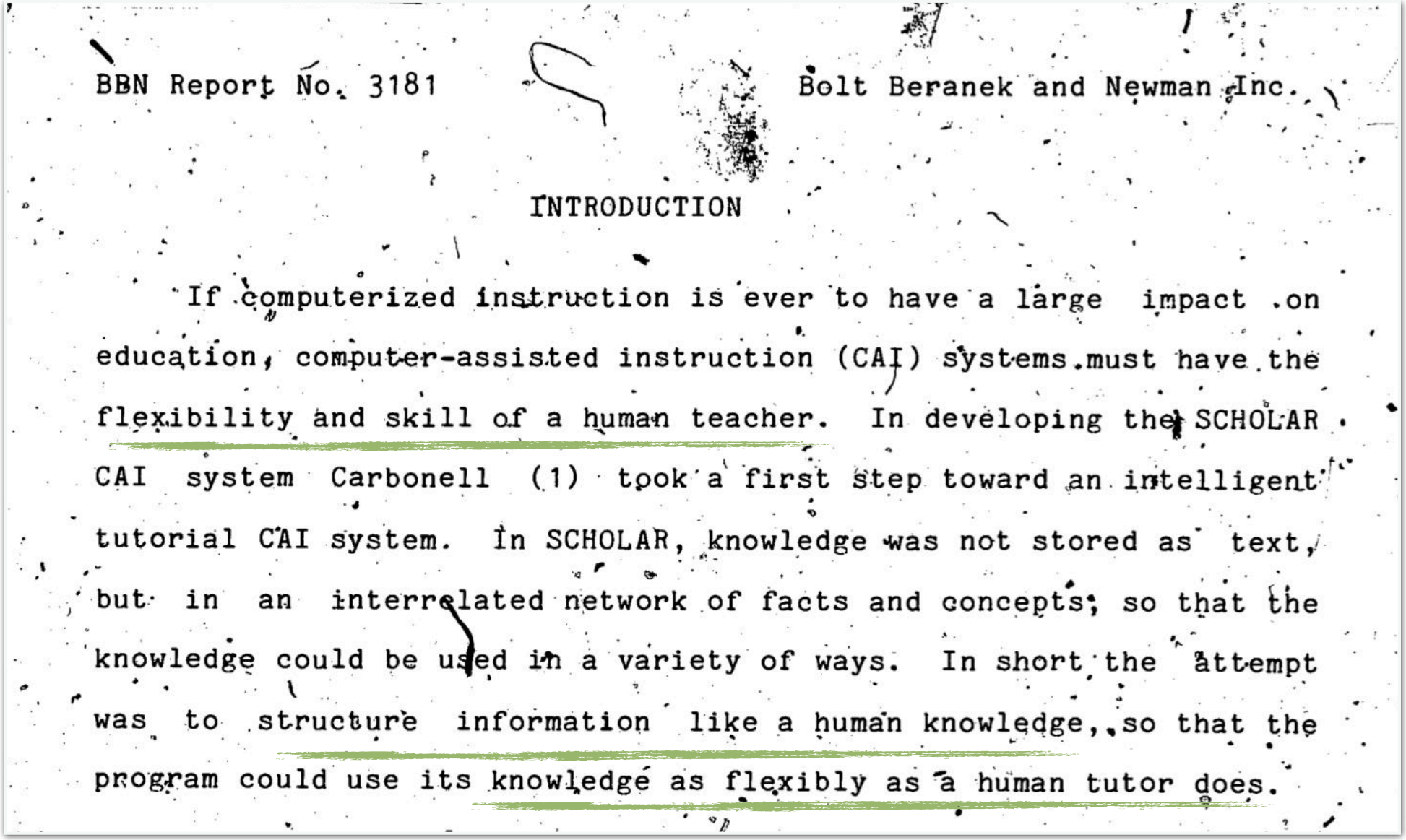


BBN Report No. 3181 Bolt Beranek and Newman Inc.

INTRODUCTION

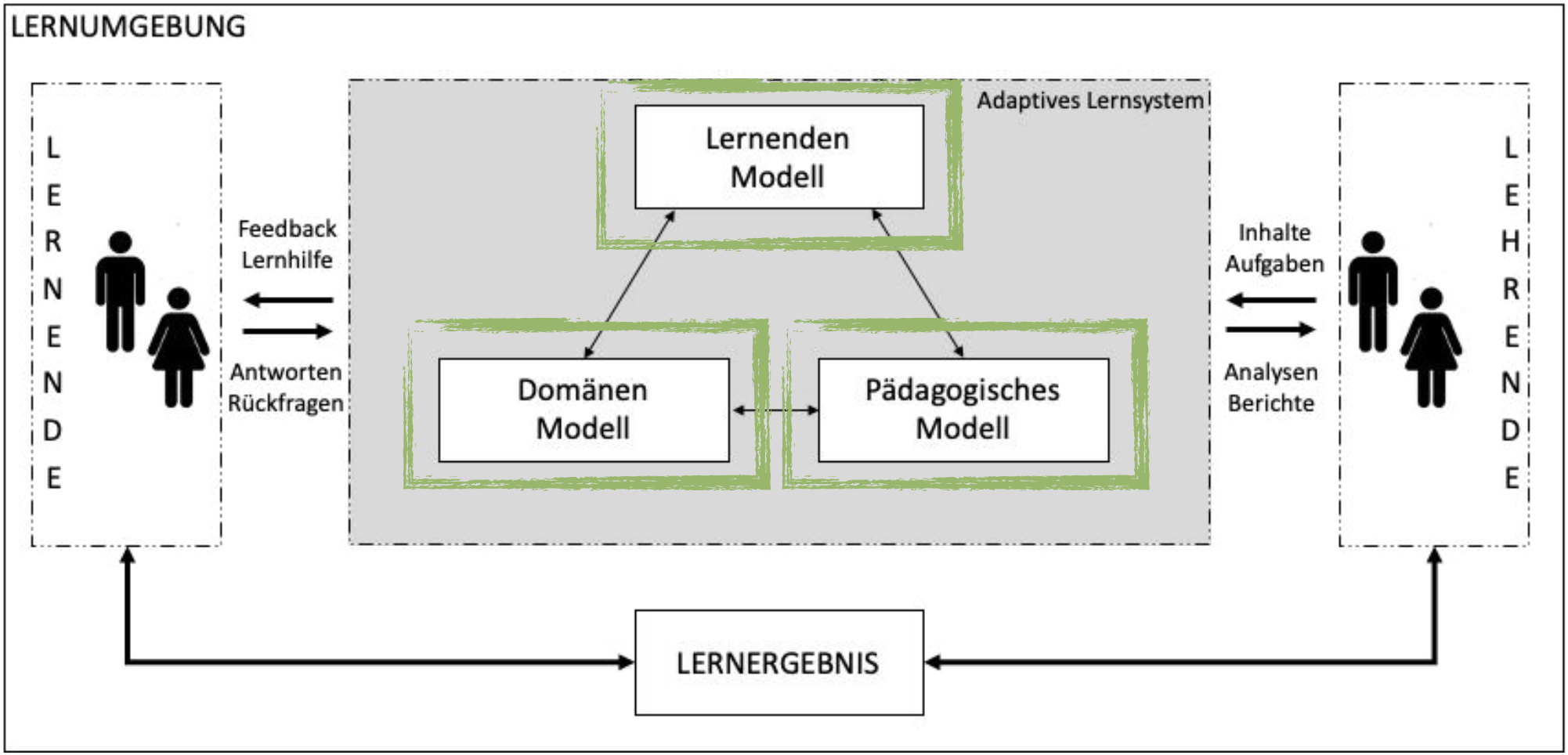
If computerized instruction is ever to have a large impact on education, computer-assisted instruction (CAI) systems must have the flexibility and skill of a human teacher. In developing the SCHOLAR CAI system Carbonell (1) took a first step toward an intelligent tutorial CAI system. In SCHOLAR, knowledge was not stored as text, but in an interrelated network of facts and concepts, so that the knowledge could be used in a variety of ways. In short the attempt was to structure information like a human knowledge, so that the program could use its knowledge as flexibly as a human tutor does.

Collins, A., & Grignetti, M. C. (1975). *Intelligent CAI. Final Report (1 March 1971-31 August 1975)*. Personnel and Training Research Programs Office.

Personalisiertes Lernen bezeichnet die Anpassung des Lernangebots an die **individuellen Voraussetzungen und Bedürfnisse** (z. B. Erwartungen, Vorkenntnisse, Fähigkeiten, Präferenzen, Lernstrategien) der Lernenden.

Definitionen zu **adaptivem Lernen** fokussieren auf die Analyse großer Mengen an Bildungsdaten (Big Data) sowie den Einsatz KI-basierter Technologien zur Anpassung des Lernangebots **an individuelle Lernprozesse**.

Hemmler, Y., & Ifenthaler, D. (2022). Personalisierte und adaptive Lernumgebungen für Online-Weiterbildungen. In S. Schumann, S. Seeber, & S. Abele (Eds.), *Digitale Transformation in der Berufsbildung. Konzept, Befunde und Herausforderungen* (pp. 145-164). wbv. https://doi.org/10.3278/9783763971381



San Pedro, M. O. Z., & Baker, R. S. (2021). Knowledge inference models used in adaptive learning. In A. A. Davier, R. J. Mislevy, & J. Hao (Eds.), *Computational psychometrics: new methodologies for a new generation of digital learning and assessment. methodology of educational measurement and assessment* (pp. 61–77). Springer. https://doi.org/10.1007/978-3-030-74394-9_5m

Ein vielversprechender Ansatz besteht darin, **Lernende die Anpassung vornehmen zu lassen** und die Änderungen der Lernenden zu berücksichtigen, um den adaptiven Algorithmus zu aktualisieren.

Brusilovsky, P. (1996). Methods and techniques of adaptive hypermedia. *User Modeling and User-Adapted Interaction*, *6*(2–3), 87–129. https://doi.org/10.1007/BF00143964

Table 8 Research methodological components (outcome variables, research design and data collection methods) in adaptive learning studies

Research methodological components	Number of studies	Percentage
Outcome variables		
Cognitive (e.g., achievement)	41	67.2
Affective (e.g., attitude)	23	37.7
Behavior (e.g., time spent)	25	41.0
Other	6	9.8
Research design		
Experimental	27	44.3
Non-experimental	11	18.0
Qualitative	6	9.8
Mixed-method	17	27.9
Data collection methods		
Test data	43	70.5
Survey	40	65.6
Extant data (Email, recording, discussion data)	25	41.0
Interview	9	14.7
Observation	5	8.2
Clickstream data/log files	4	6.6

Martin, F., Chen, Y., Moore, R. L., & Westine, C. D. (2020). Systematic review of adaptive learning research designs, context, strategies, and technologies from 2009 to 2018. *Educational Technology Research and Development*, *68*, 1903–1929. https://doi.org/10.1007/s11423-020-09793-2

Table 11 Adaptive targets (content and instructional characteristics) in adaptive learning environments

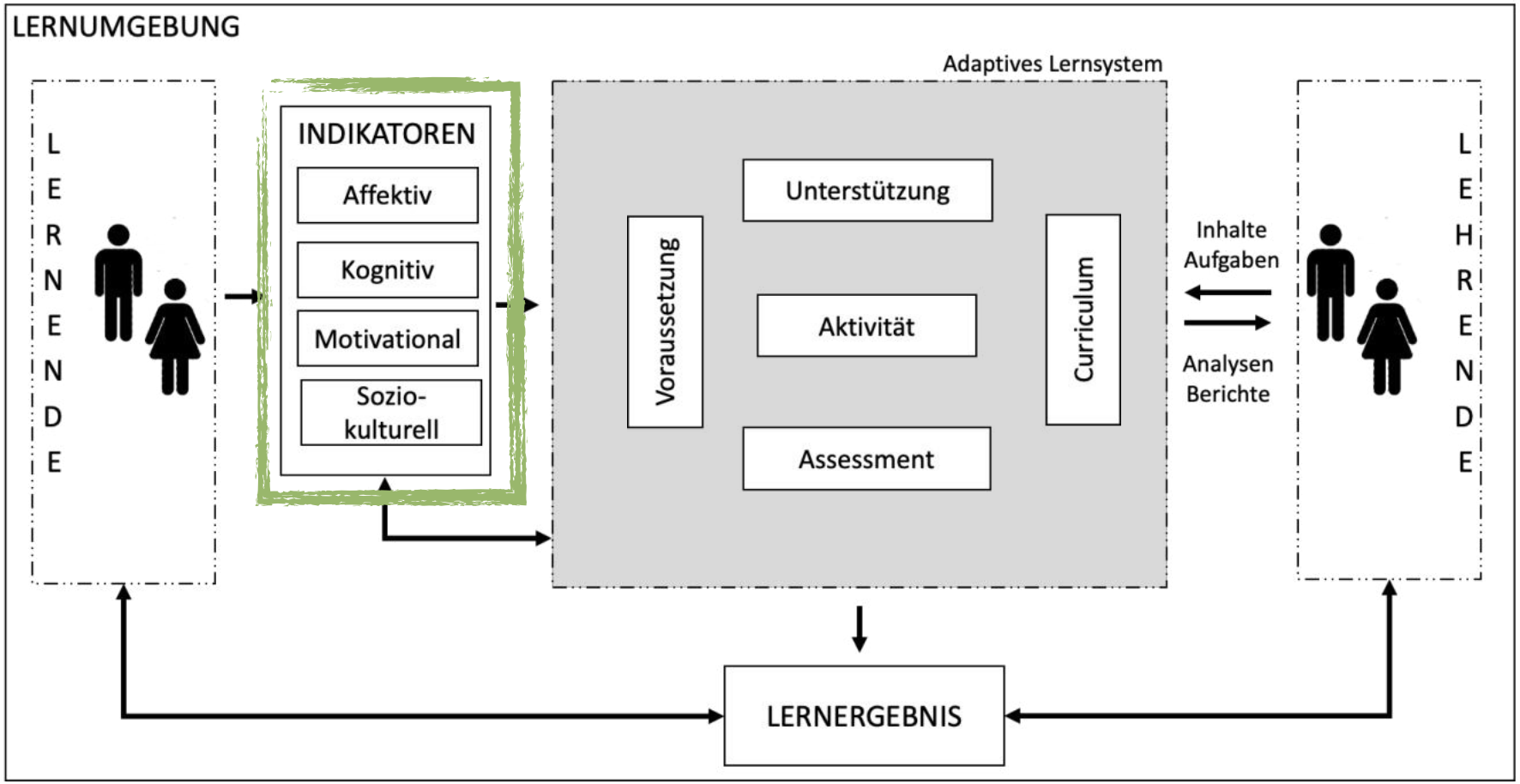
What was adapted?	Adaptive target	Number of studies
Content	Adaptive content	9
Assessment	Adaptive feedback	8
Assessment	Adaptive course topic and question difficulty	4
Navigation	Adaptive learning sequence	5
Navigation	Adaptive learning path	5
Navigation	Adaptive pacing	1
Navigation	Adaptive navigation	1
Presentation	Adaptive caption filtering	1
Presentation	Adaptive material format and presentation	4

Martin, F., Chen, Y., Moore, R. L., & Westine, C. D. (2020). Systematic review of adaptive learning research designs, context, strategies, and technologies from 2009 to 2018. *Educational Technology Research and Development*, *68*, 1903–1929. https://doi.org/10.1007/s11423-020-09793-2

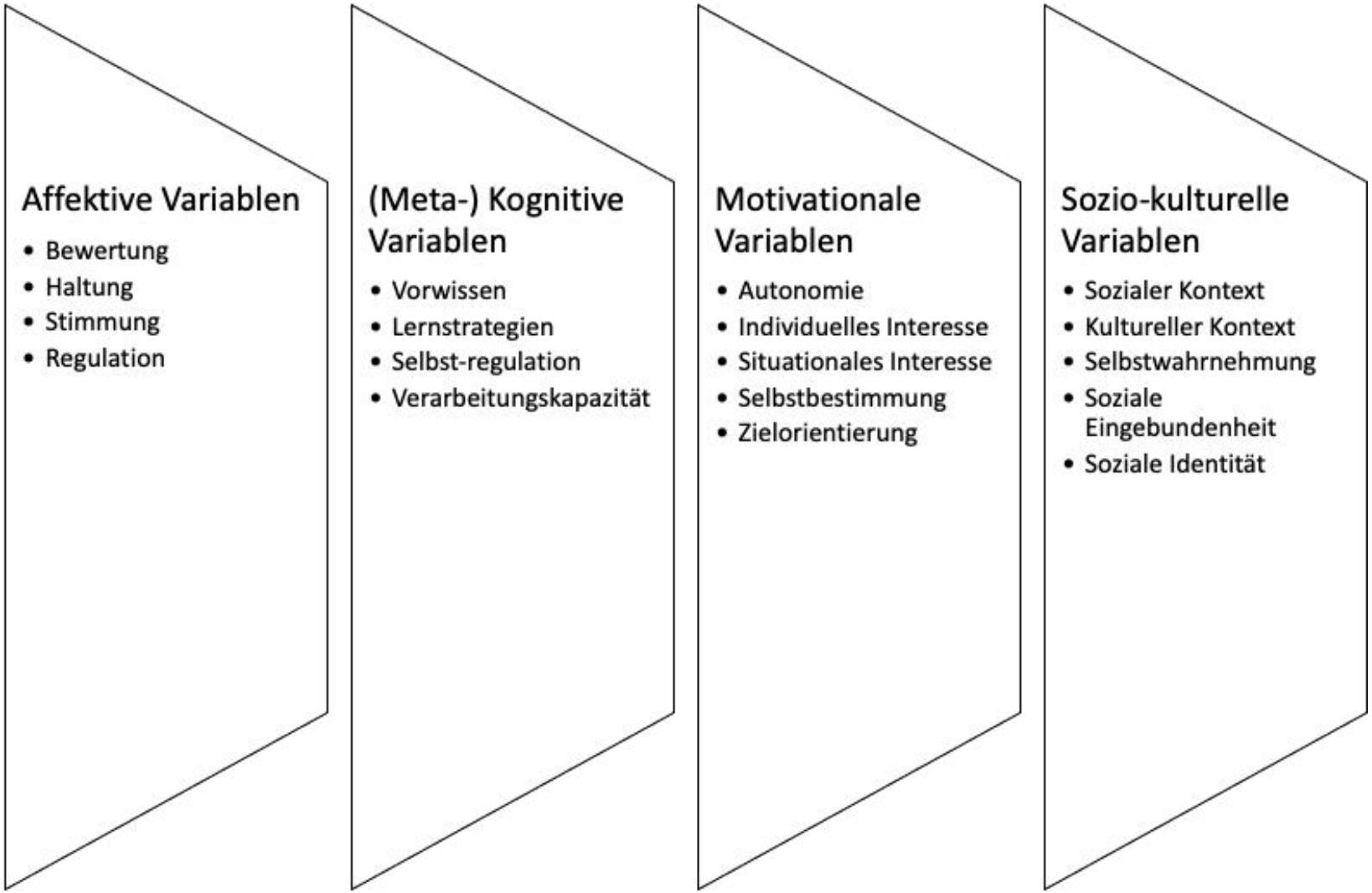
Valide Indikatoren zur Unterstützung von Algorithmen sind die **Voraussetzung für adaptive Lernumgebungen** in der Hochschulbildung.

Yau, J., & Ifenthaler, D. (2020). Reflections on different learning analytics indicators for supporting study success. *International Journal of Learning Analytics and Artificial Intelligence for Education*, *2*(2), 4–23. https://doi.org/10.3991/ijai.v2i2.15639

Makro-Perspektive adaptiver Lernumgebungen

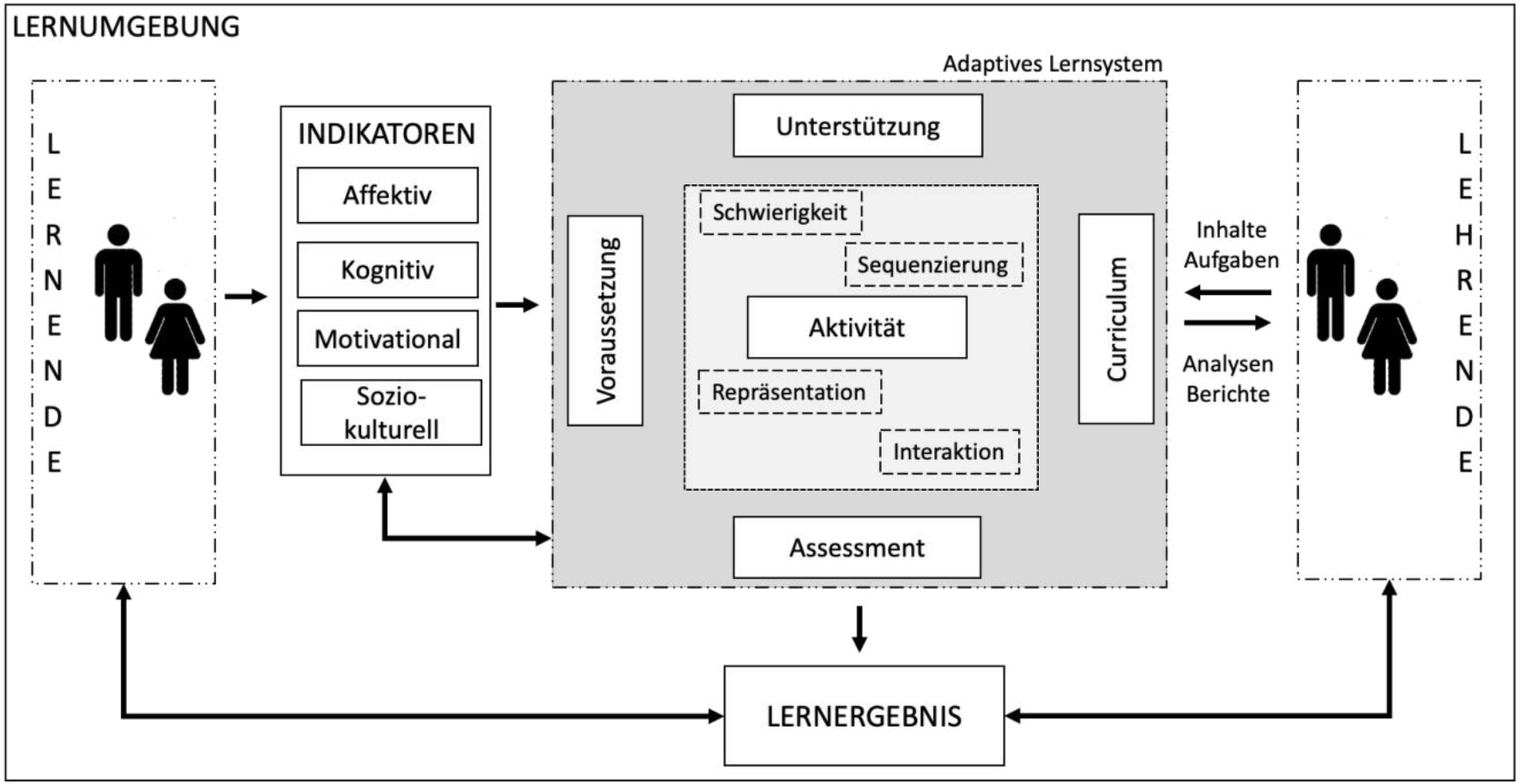


Hemmler, Y., & Ifenthaler, D. (2022). Four perspectives on personalized and adaptive learning environments for workplace learning. In D. Ifenthaler & S. Seufert (Eds.), *Artificial intelligence education in the context of work* (pp. 27–39). Springer. https://doi.org/10.1007/978-3-031-14489-9_2



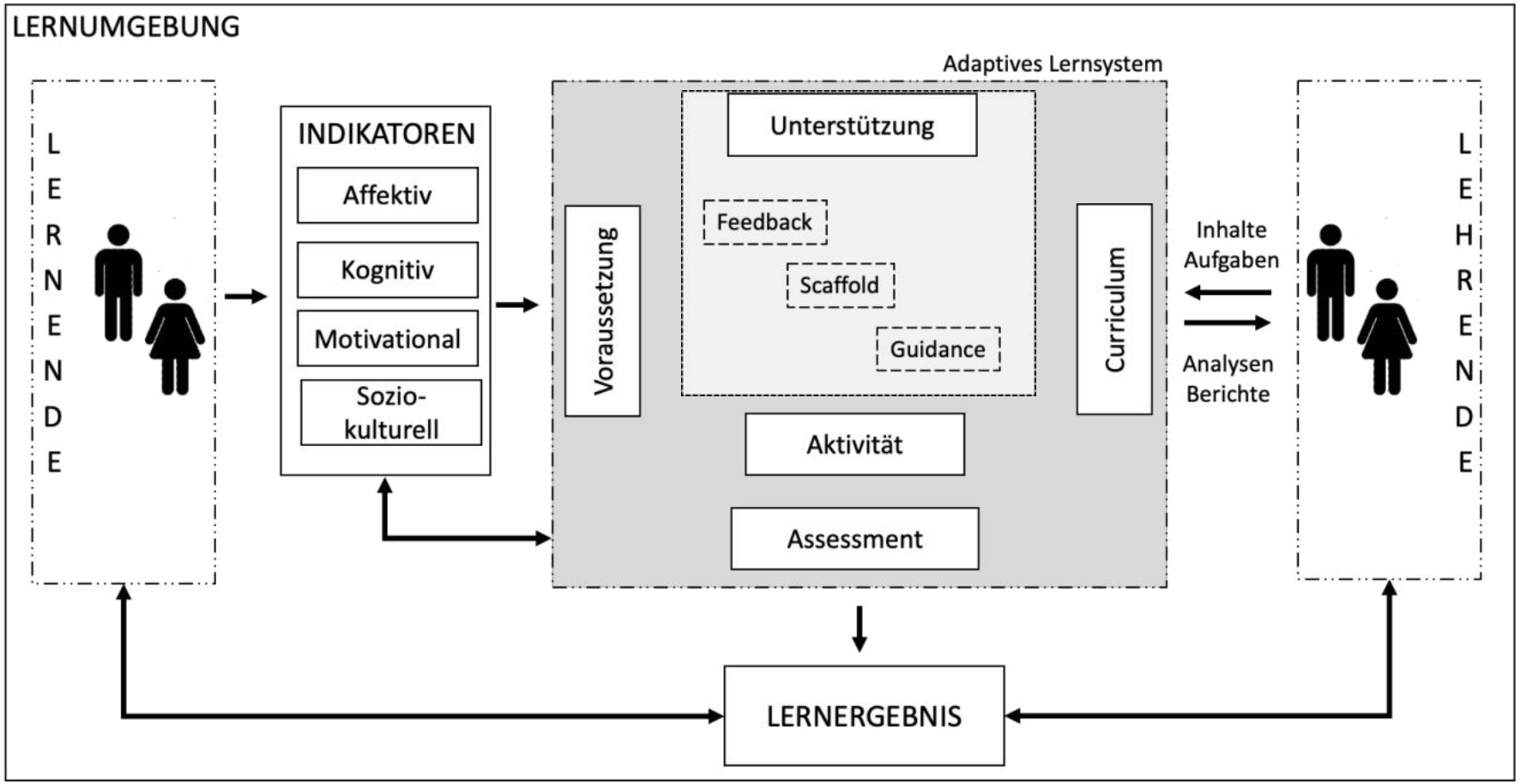
Plass, J. L., & Pawar, S. (2020). Toward a taxonomy of adaptivity for learning. *Journal of Research on Technology in Education*, *52*(3), 275–300. https://doi.org/10.1080/15391523.2020.1719943

Mikro-Perspektive: Aktivität



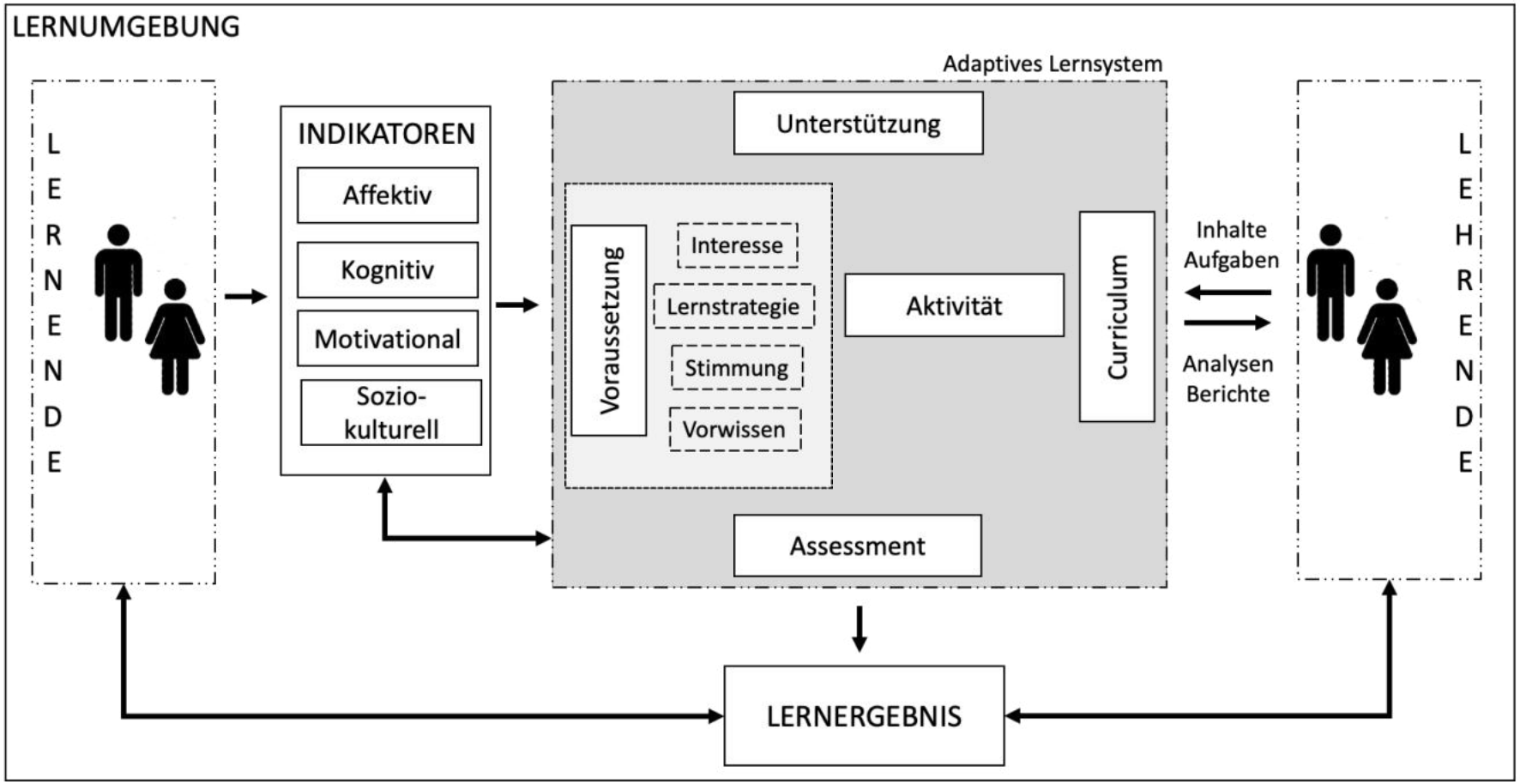
Hemmler, Y., & Ifenthaler, D. (2022). Four perspectives on personalized and adaptive learning environments for workplace learning. In D. Ifenthaler & S. Seufert (Eds.), *Artificial intelligence education in the context of work* (pp. 27–39). Springer. https://doi.org/10.1007/978-3-031-14489-9_2

Mikro-Perspektive: Unterstützung



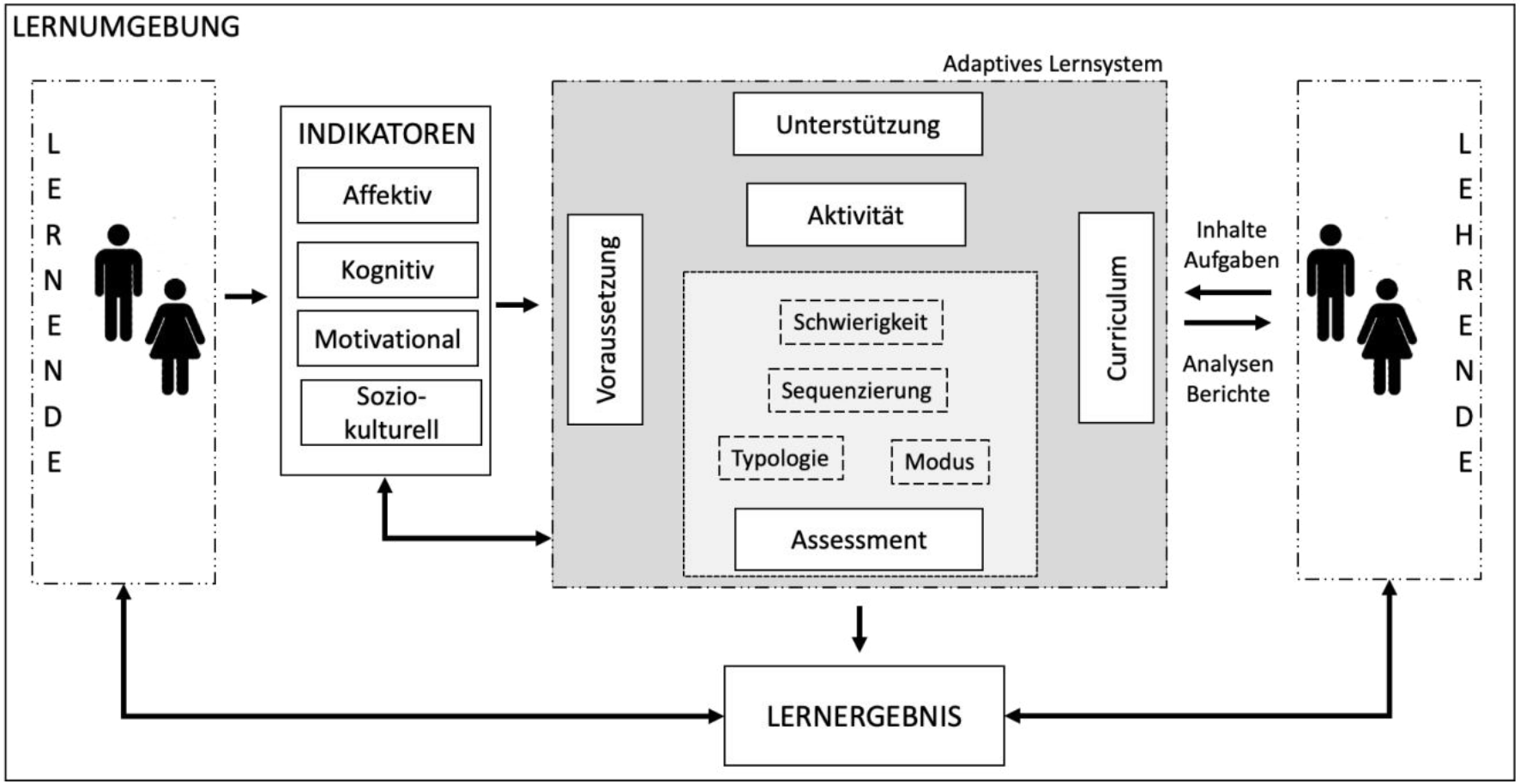
Hemmler, Y., & Ifenthaler, D. (2022). Four perspectives on personalized and adaptive learning environments for workplace learning. In D. Ifenthaler & S. Seufert (Eds.), *Artificial intelligence education in the context of work* (pp. 27–39). Springer. https://doi.org/10.1007/978-3-031-14489-9_2

Mikro-Perspektive: Voraussetzung



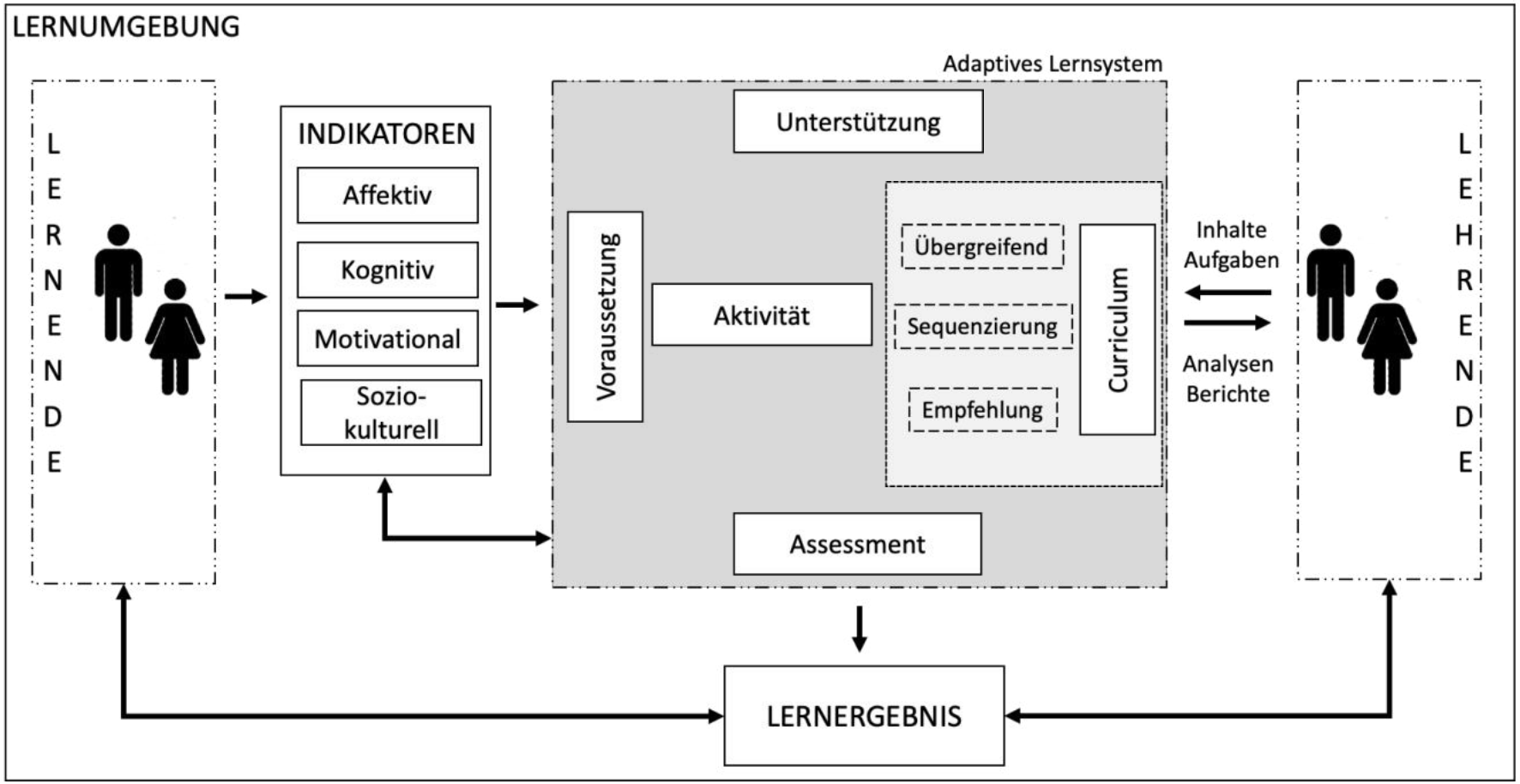
Hemmler, Y., & Ifenthaler, D. (2022). Four perspectives on personalized and adaptive learning environments for workplace learning. In D. Ifenthaler & S. Seufert (Eds.), *Artificial intelligence education in the context of work* (pp. 27–39). Springer. https://doi.org/10.1007/978-3-031-14489-9_2

Mikro-Perspektive: Assessment

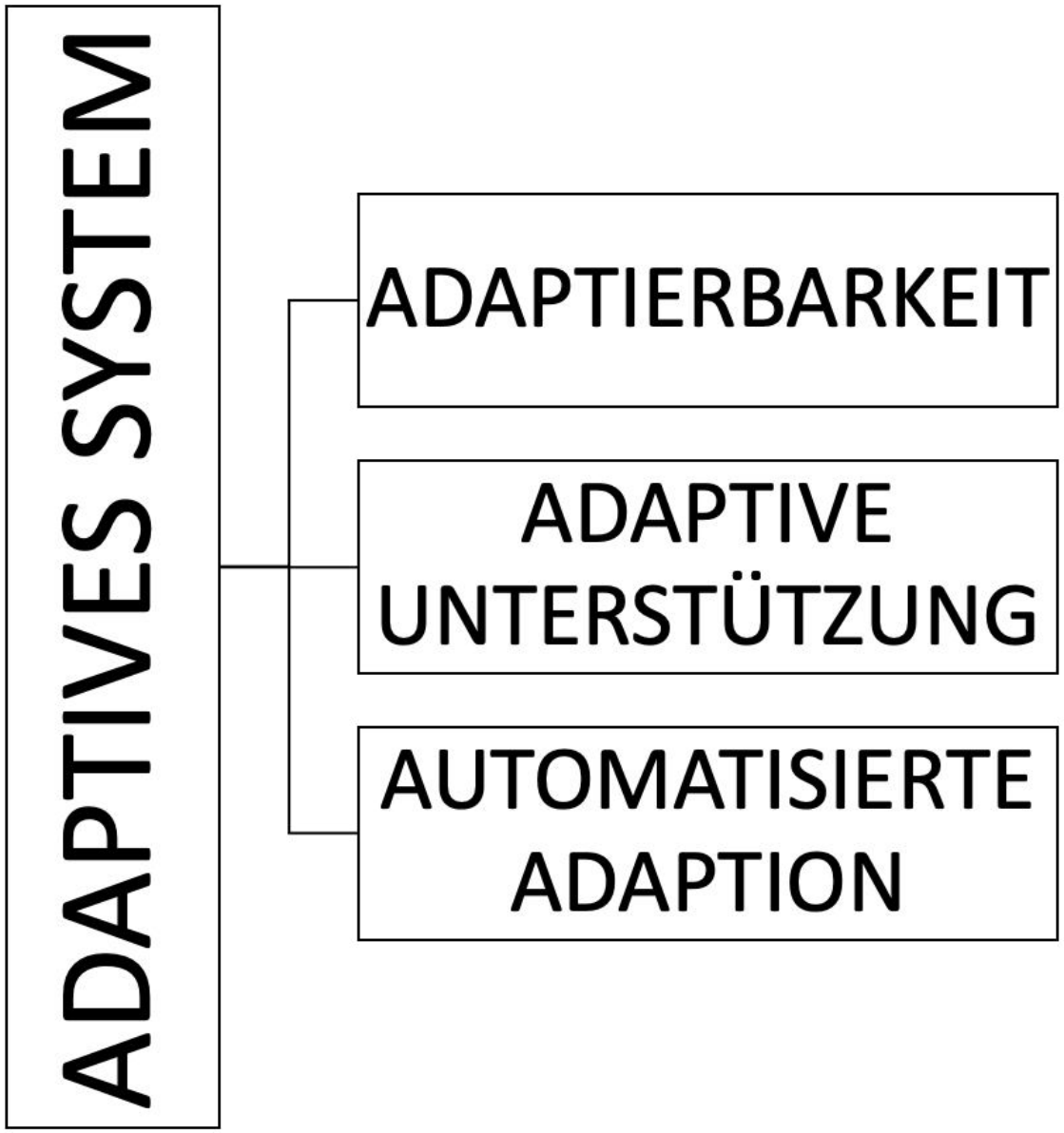


Hemmler, Y., & Ifenthaler, D. (2022). Four perspectives on personalized and adaptive learning environments for workplace learning. In D. Ifenthaler & S. Seufert (Eds.), *Artificial intelligence education in the context of work* (pp. 27–39). Springer. https://doi.org/10.1007/978-3-031-14489-9_2

Mikro-Perspektive: Curriculum



Hemmler, Y., & Ifenthaler, D. (2022). Four perspectives on personalized and adaptive learning environments for workplace learning. In D. Ifenthaler & S. Seufert (Eds.), *Artificial intelligence education in the context of work* (pp. 27–39). Springer. https://doi.org/10.1007/978-3-031-14489-9_2



Selbstregulation

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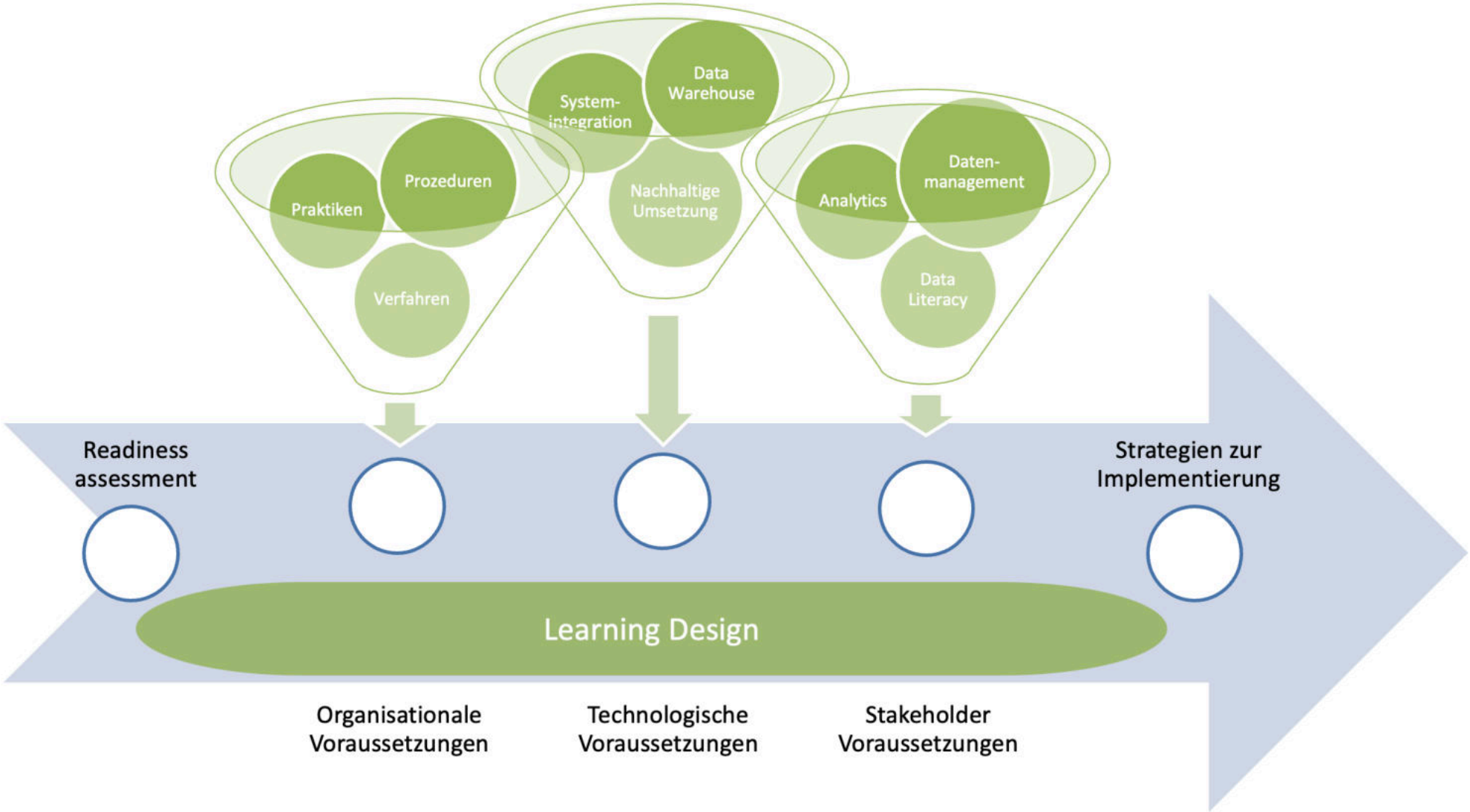
Die Implementierung von adaptiven Lernumgebungen erfordert eine **Weiterentwicklung** von **Systemen, Prozessen** und **Stakeholdern**.

Ifenthaler, D. (2017). Are higher education institutions prepared for learning analytics? *TechTrends*, *61*(4), 366–371. https://doi.org/10.1007/s11528-016-0154-0

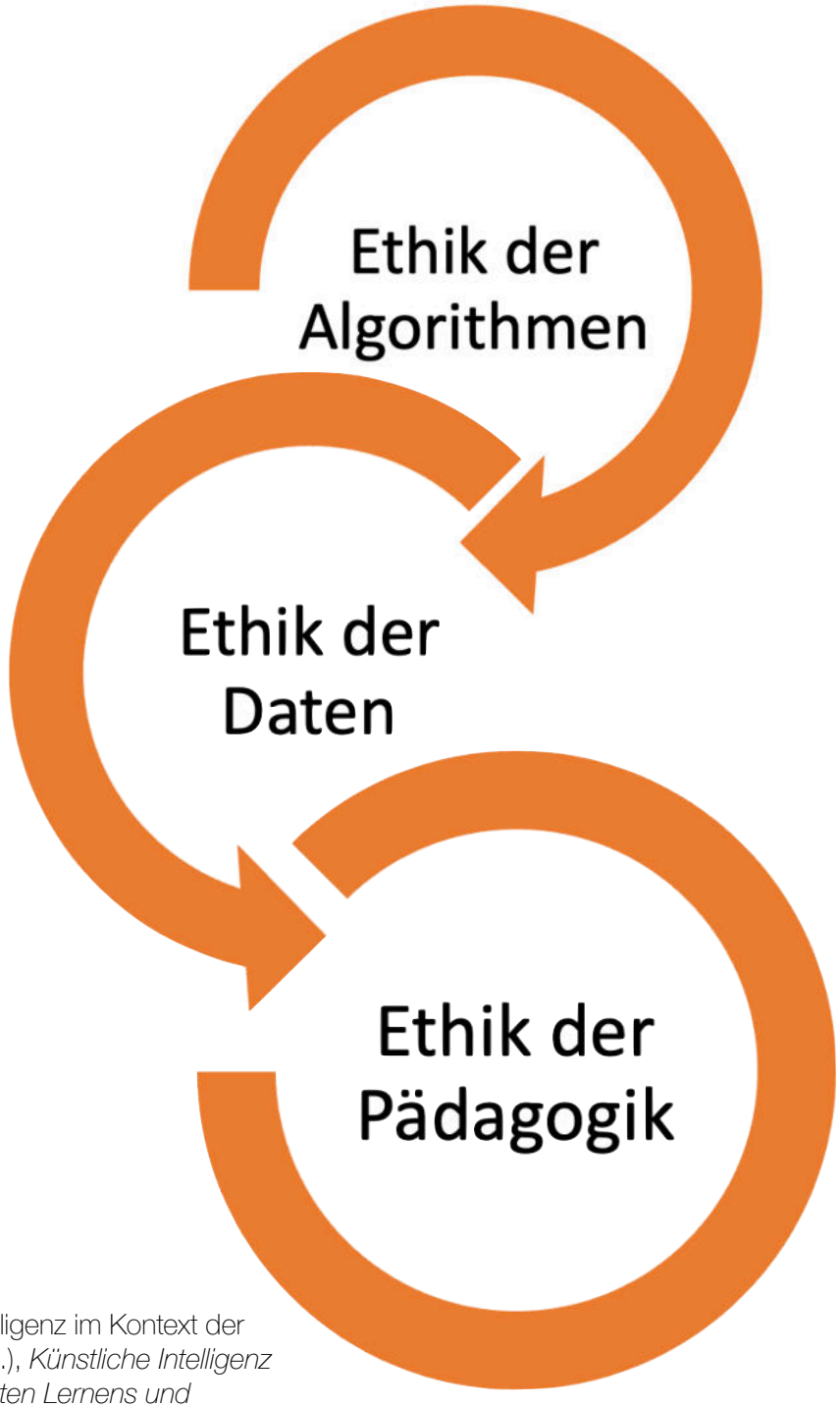


Ifenthaler, D. (2020). Change management for learning analytics. In N. Pinkwart & S. Liu (Eds.), *Artificial intelligence supported educational technologies* (pp. 261–272). Springer. https://doi.org/10.1007/978-3-030-41099-5_15


Hochschulbildung berechenbar machen?
Nachhaltige digitale Transformation der Hochschulbildung?
1
2
3
4
Hochschulbildung demokratischer gestalten?
Hochschulbildung personalisierter gestalten?

Digitale Technologien sind **nicht neutral**, sondern formen durch ihre bloße Existenz **Überzeugungen** und **Wünsche** sowie verändern die **kollektive Intentionalität**.

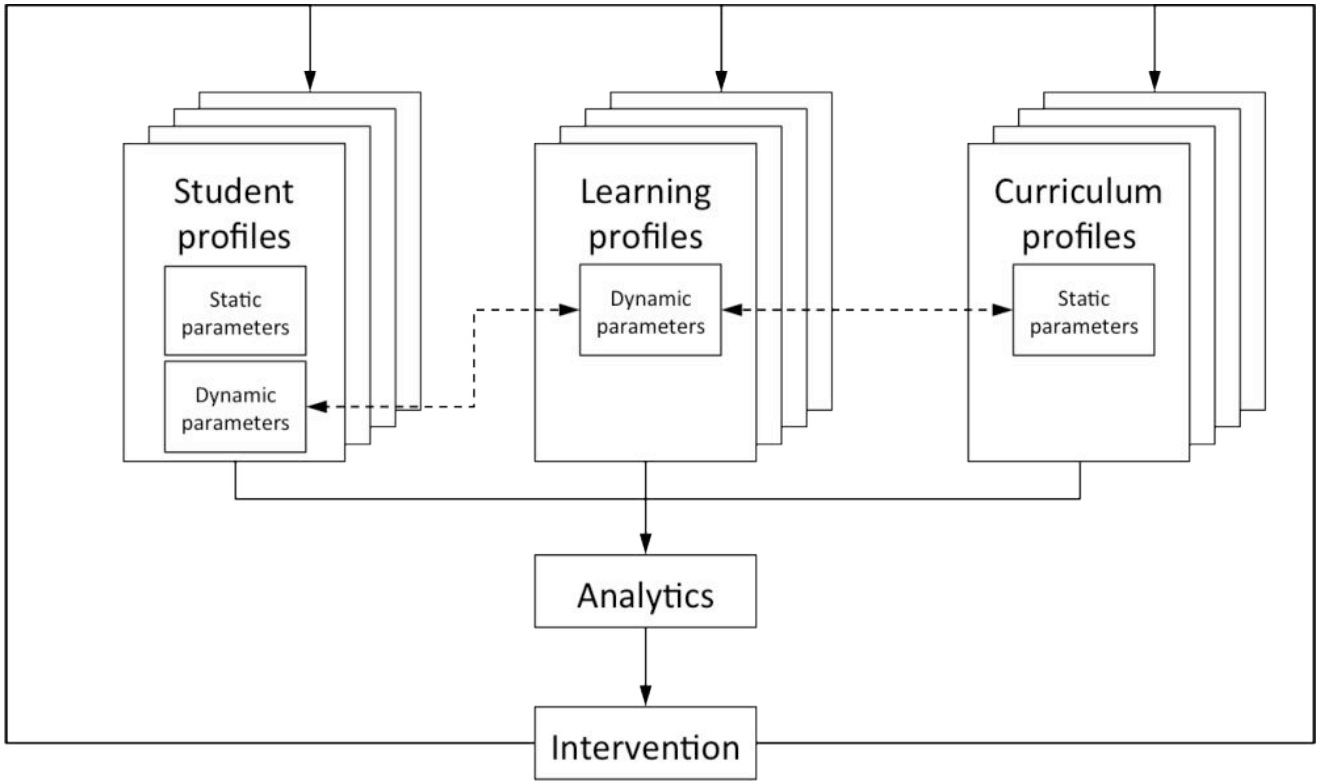
Searl, J. R. (1971). *The philosophy of language*. Oxford University Press.



Ifenthaler, D. (2023). Ethische Perspektiven auf künstliche Intelligenz im Kontext der Hochschule. In T. Schmohl, A. Watanabe, & K. Schelling (Eds.), *Künstliche Intelligenz in der Hochschulbildung. hancen und Grenzen des KI-gestützten Lernens und Lehrens* (pp. 71–86). transcript-Verlag. https://doi.org/10.14361/9783839457696

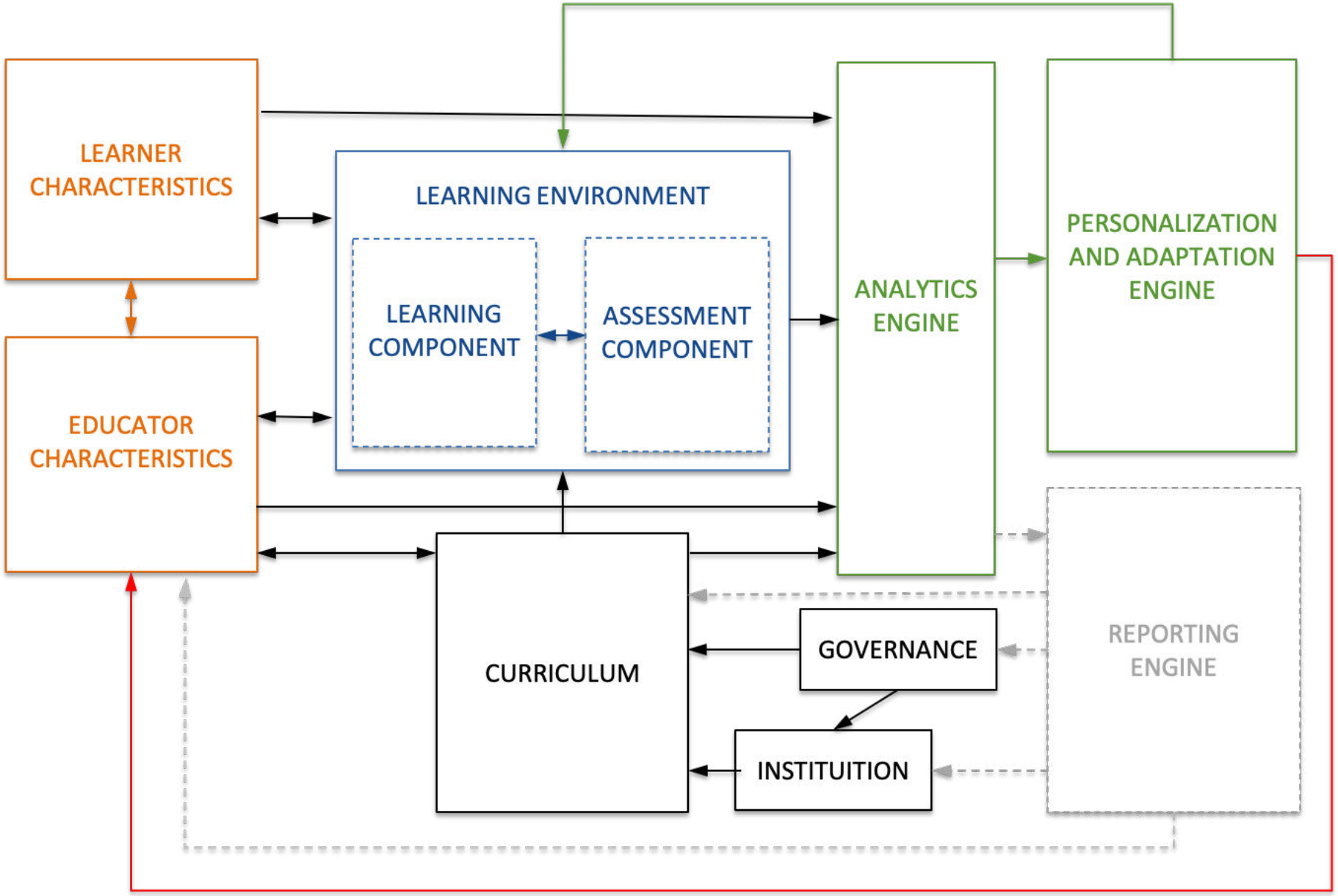
01

Daten- und Lern-Architektur.

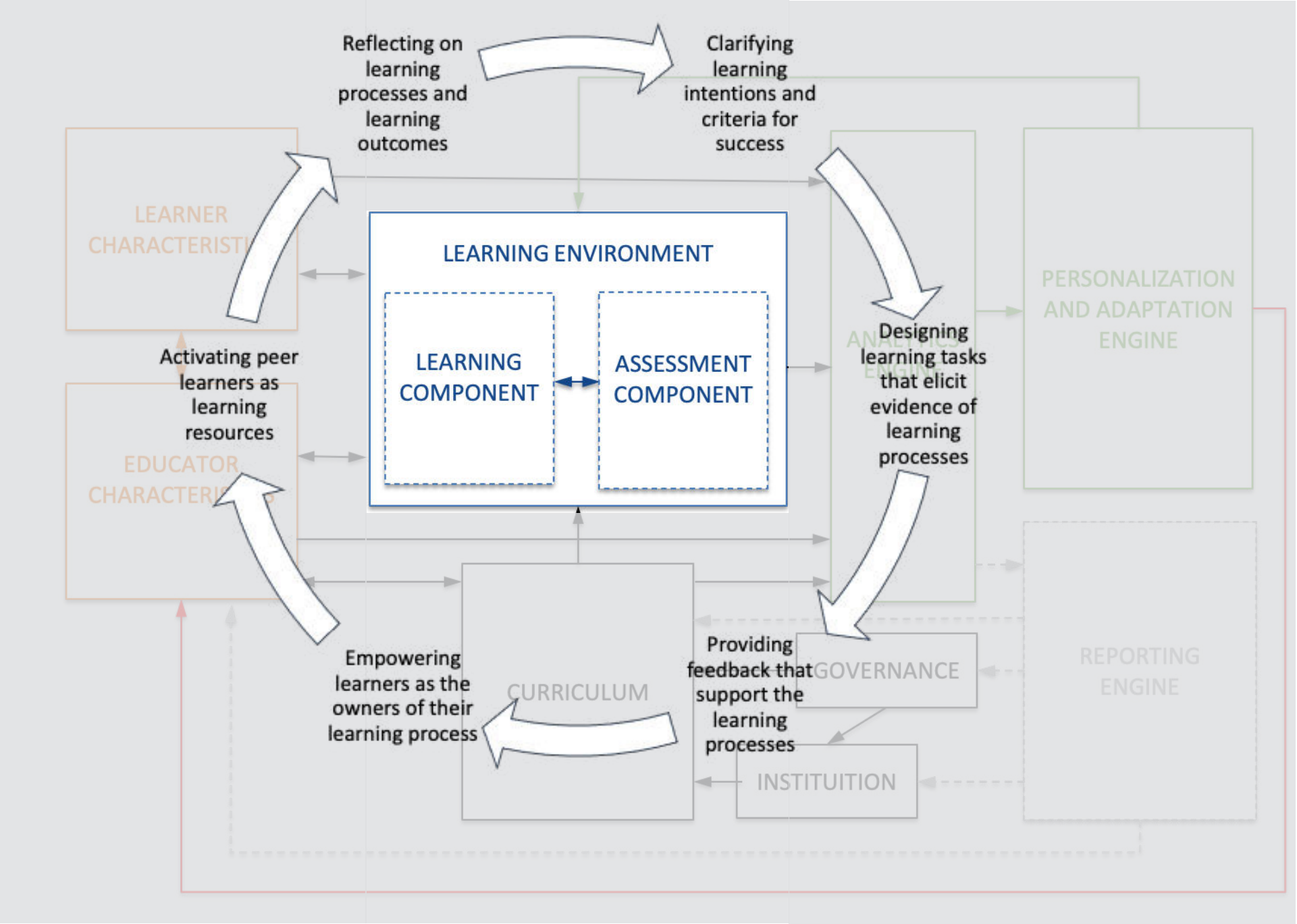


LeAP

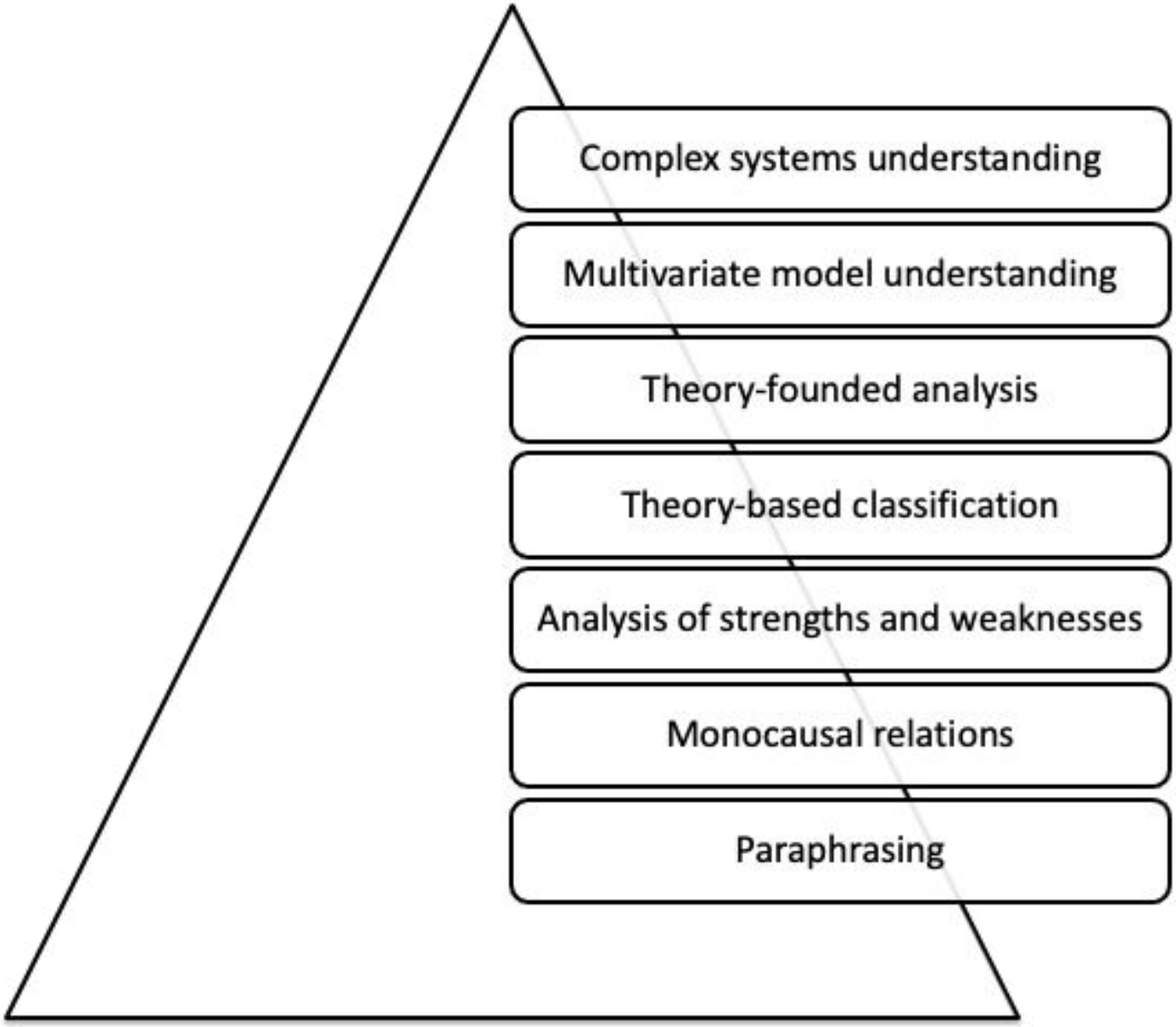
Ifenthaler, D., & Widanapathirana, C. (2014). Development and validation of a learning analytics framework: Two case studies using support vector machines. *Technology, Knowledge and Learning*, *19*(1–2), 221–240. https://doi.org/10.1007/s10758-014-9226-4



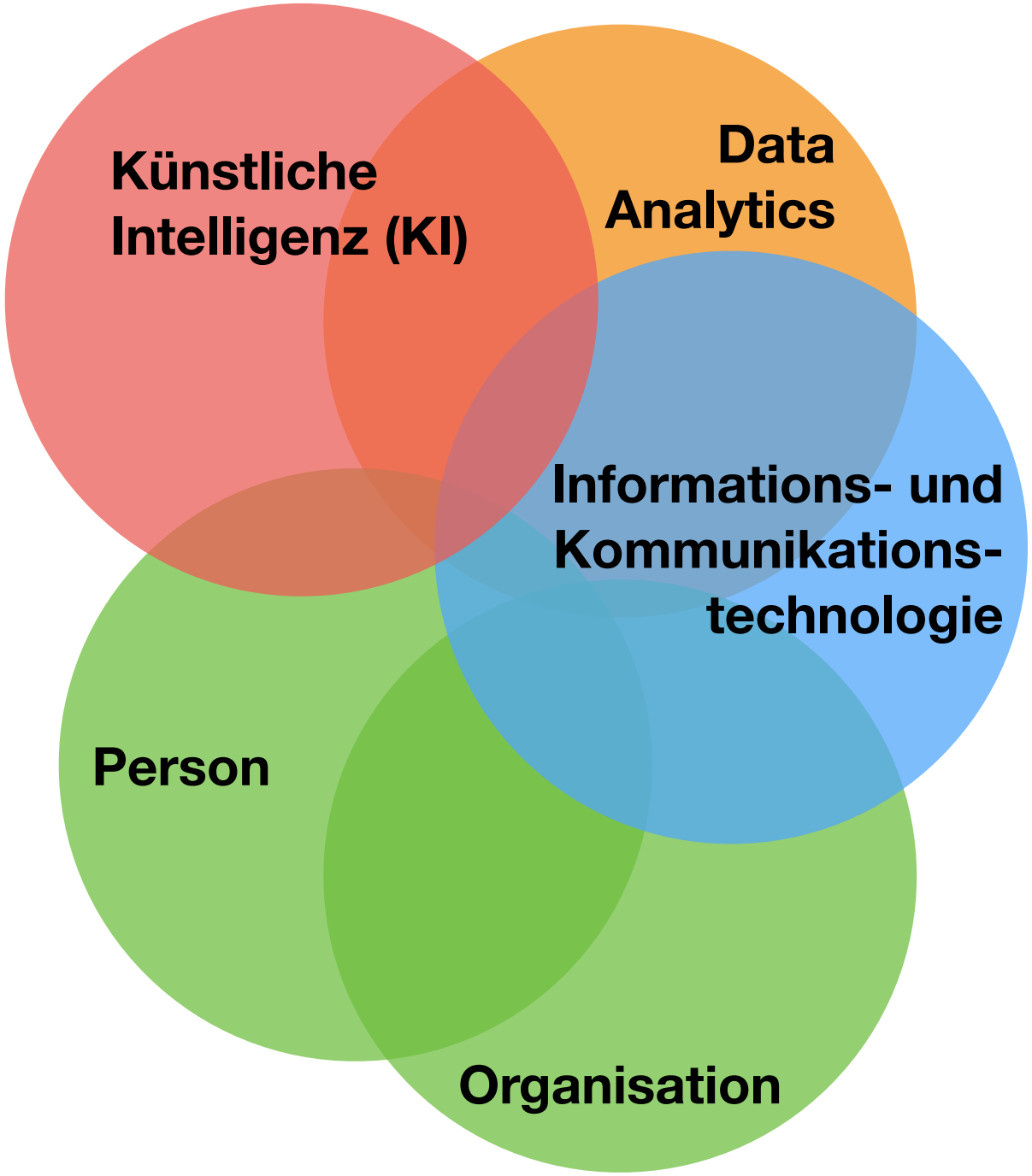
Ifenthaler, D., & Greiff, S. (2021). Leveraging learning analytics for assessment and feedback. In J. Liebowitz (Ed.), *Online learning analytics* (pp. 1–18). Auerbach Publications. https://doi.org/10.1201/9781003194620



Ifenthaler, D., & Greiff, S. (2021). Leveraging learning analytics for assessment and feedback. In J. Liebowitz (Ed.), *Online learning analytics* (pp. 1–18). Auerbach Publications. https://doi.org/10.1201/9781003194620



Pirnay-Dummer, P., Ifenthaler, D., & Seel, N. M. (2012). Designing model-based learning environments to support mental models for learning. In D. H. Jonassen & S. Land (Eds.), *Theoretical foundations of learning environments* (2 ed., pp. 66–94). Routledge.



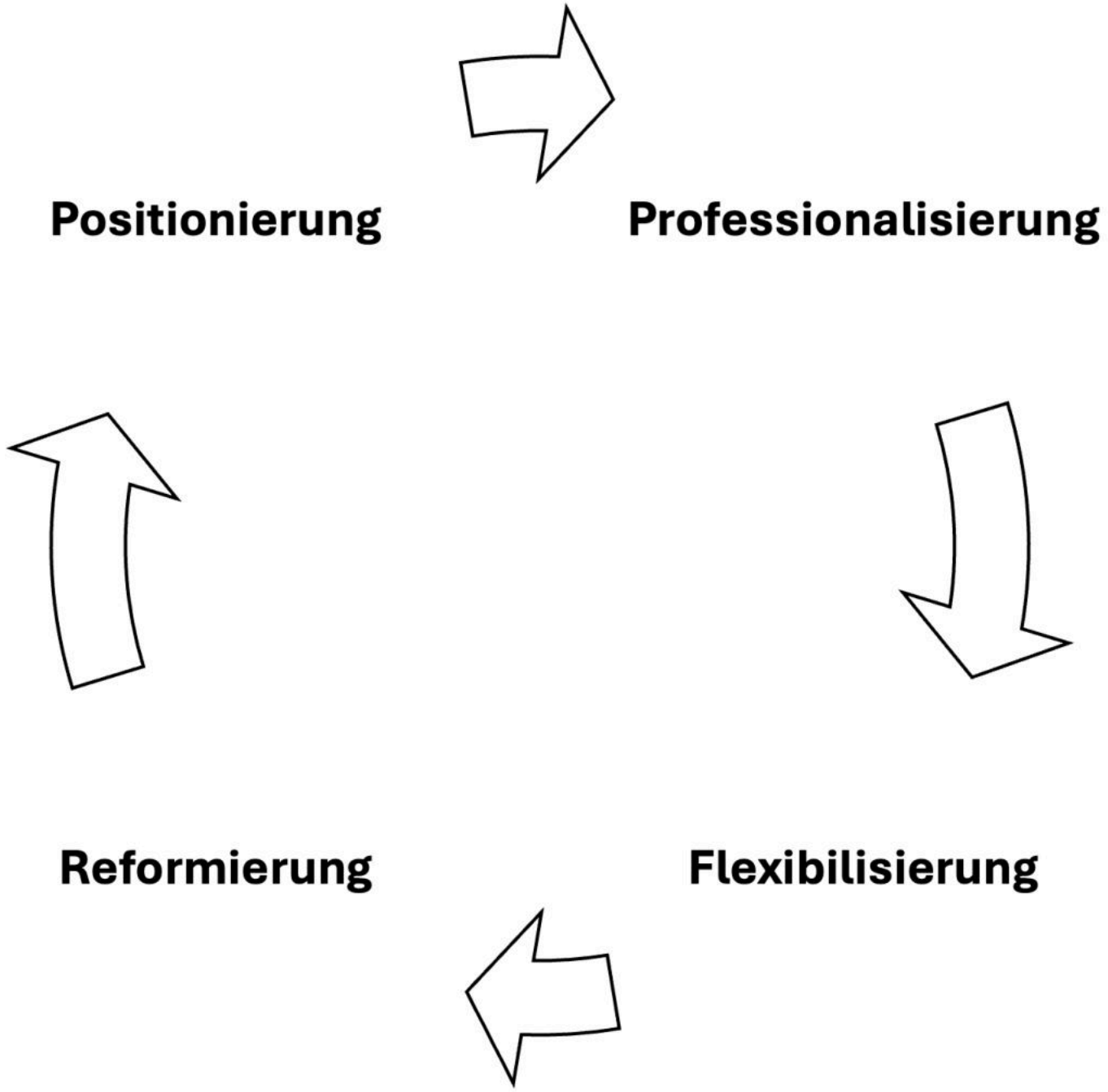
De Laat, M., Joksimovic, S., & Ifenthaler, D. (2020). Artificial intelligence, real-time feedback and workplace learning analytics to support in situ complex problem-solving: a commentary. *International Journal of Information and Learning Technology*, *37*(5), 267–277. https://doi.org/10.1108/IJILT-03-2020-0026

02

Nachhaltige Lernkultur.

Die **Organisation will oft anderes vom Menschen** als der Mensch von der Organisation.

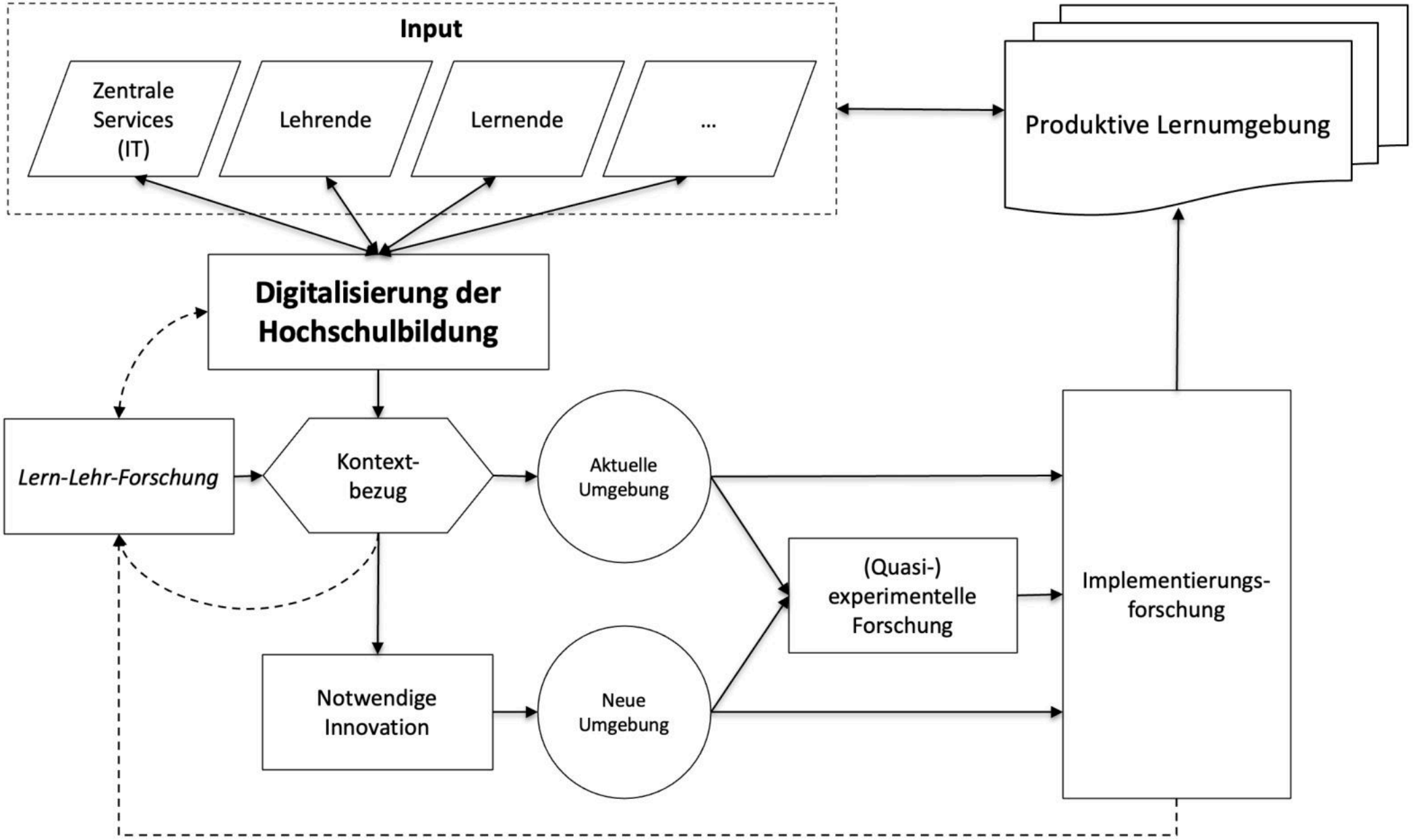
Luhmann, N. (2000). *Organisation und Entscheidung*. Springer Fachmedien. https://doi.org/10.1007/978-3-322-97093-0



Euler, D., & Seufert, S. (2011). Change Management in der Hochschullehre: Die nachhaltige Implementierung von e-Learning-Innovationen. Zeitschrift für Hochschulentwicklung. https://doi.org/10.3217/zfhd03/02

Strategien und **Rahmenwerke**, die eine **angemessene Nutzung** der Digitalisierung in Hochschulen gewährleisten, sind der Schlüssel für deren **nachhaltigen Einführung** und **Nutzung**.

Ifenthaler, D., Majumdar, R., Gorissen, P., Judge, M., Mishra, S., Raffaghelli, J., & Shimada, A. (2024). Artificial intelligence in education: implications for policymakers, researchers, and practitioners. *Technology, Knowledge and Learning, 29*(4), 1693–1710. https://doi.org/10.1007/s10758-024-09747-0



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Energieeffiziente Hard- und **Software** sowie **gemeinsam genutzte Infrastrukturen,** die auf **erneuerbarer Energie** basieren sind entscheidend für ihren **nachhaltigen Betrieb** und ihre Skalierung im Kontext der Hochschulbildung.

Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., . . . Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, *103*, 102274. https://doi.org/https://doi.org/10.1016/j.lindif.2023.102274

Digitalisierung als Treiber für Change Prozesse an Hochschulen

Prof. Dr. Dr. h.c. Dirk Ifenthaler

Department Chair of Economic and Business Education – Learning, Design and Technology, University of Mannheim
UNESCO Co-Chair on Data Science in Higher Education Learning and Teaching, Curtin University

https://ifenthaler.info · dirk@ifenthaler.info