Lernen als prozessorientierter Bezugspunkt formaler Bildung

Ein transdisziplinäres Modell

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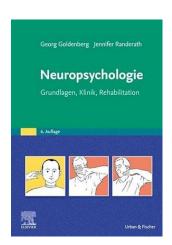


AUSGANGSPUNKT: Was ist Lernen?

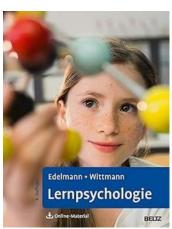
- Was Inhalt: Sprache, Instrument, "Fach"
- ➤ Wo Kontext: formal, informell, nonformal
- ➤ Wer Sozialer Aspekt: Einzelperson, Gruppe, Gesellschaft

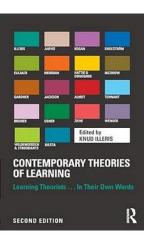
→ Pädagogik, Psychologie, Biologie, Medizin, ...

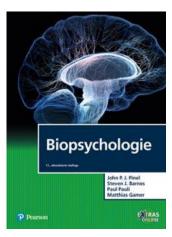
Ziel: Lernen "Adäquat" *Modellieren*











Lernmodelle ...

Außenperspektive

Sichtweisen der Forschung auf das Phänomen Lernen im 20. Jahrhundert

Innenperspektive

~1910 – 1950: *Behaviorismus*Pawlow, Watson (Stimulus-Response Modell)
Skinner (Operantes Verhalten)

~1945 – 1980: *Kybernetik/Informaţionstheorie*Norbert Wiener (technische Informationsverarbeitung)
G. Bateson, P. Watzlawick (Mentale Forschung)

~1960-1985: *Kdgnitivismus*Noam Chomskys, Albert Bandura, Jean Piaget

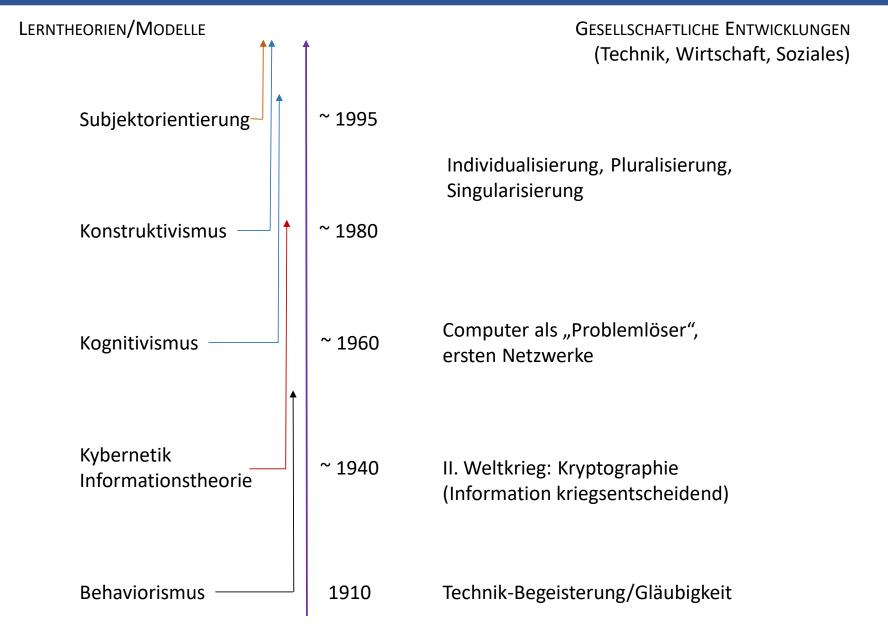
~1975 – 2000: (Radikaler) Konstruktivismus Glasersfeld, Foerster, Paul Watzlawick

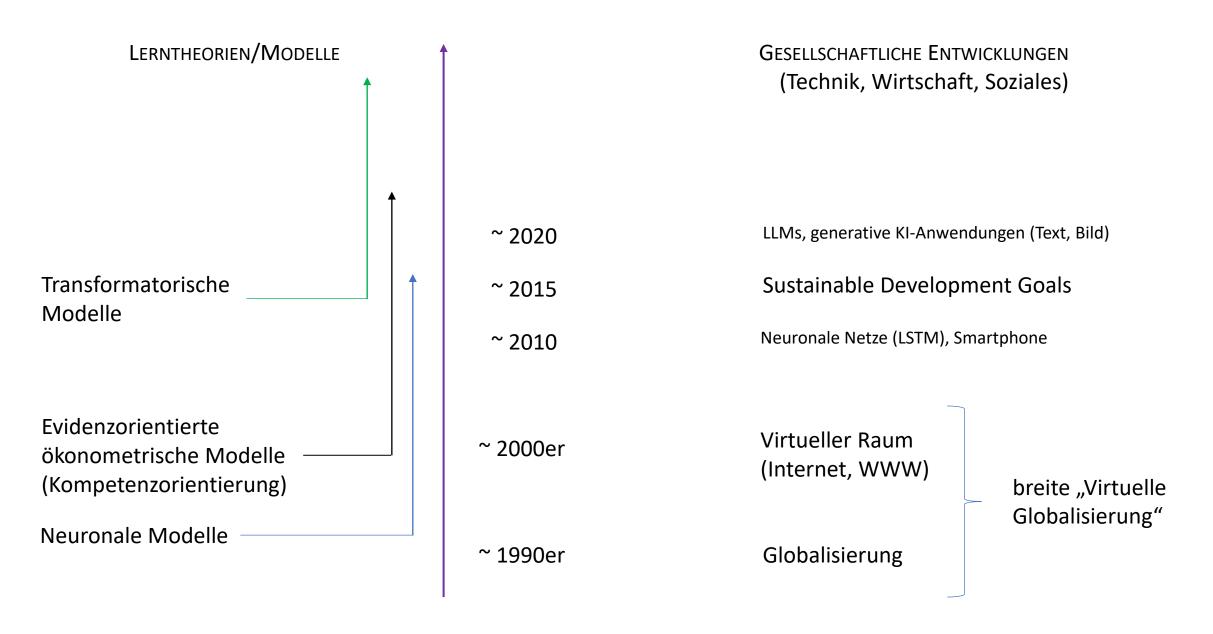
~1990 – heute: Sozialer/interaktionistischer Konstruktivismus Gergen, Reich, Rolf Arnold und Horst Siebert

~ 1995 – heute: *Sozial* & *Subjektorientierung* Meyer Drawe, Meueler, Holzkamp

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Modelle des Lernens entwickeln sich ko-evolutionär im Kontext gesellschaftlicher Diskurse (Wissenschaft, Technologie, Wirtschaft, Gesellschaft)

Modell entwickeln, das

- ➤ Individuelle und kollektive Lernprozesse beschreibt
- Kontext berücksichtigt
- > Inhaltlich offen ist
- > quantitative und qualitative Aussagen zulässt
- > prozessorientiert und prozess-offen ist
- > Gesellschaftlichen Kontext reflektiert

Zielperspektive ...

A shift from best practice to next practice

- good practice
- best practice
- next practice

Development of next practice

CHANGE OF PATTERN

intervention

good practice

critical instability

-> Betonung des Musterwechsels

-> Notwendigkeit der Instabilität

Process of renewal

Stallity

→ INDIVIDUEN & SYSTEME

Kraler/Schratz 2012, basierend auf Kruse 2004

Entwicklung

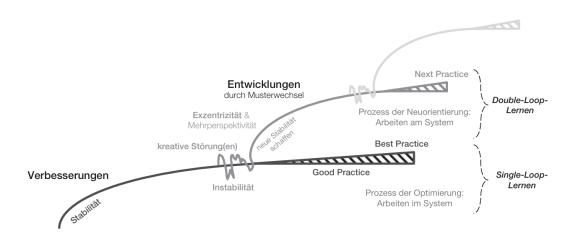


Abbildung III.1.2: Next Practice – Von Verbesserungen zur Entwicklung und zu Verbesserungen (eigene Darstellung in Anlehnung an Kruse, 2004)

Wiesner/Schreiner 2019

Mikrodynamik des Musterwechsels

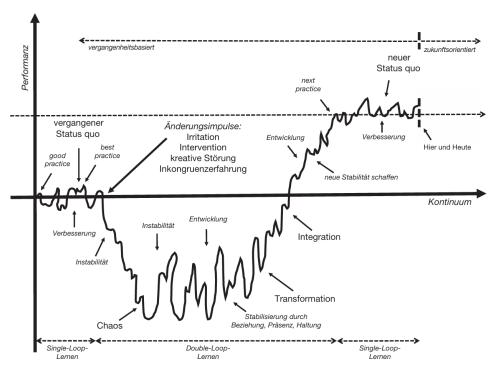


Abbildung III.1.3: Das Modell der Entwicklung und Verbesserung (eigene Darstellung)



MODELL:

- -> erfahrungsbasiert
- -> qualitativ
- -> diskrete bzw. diskontinuierliche Ansätze
- -> interventionsorientiert
- -> transformatorisch

LITERATUR:

- > Kruse 2004
- > Schratz 2009
- > Holz 2011
- > Kraler/Schratz 2012
- Wiesner/Schreiner 2019



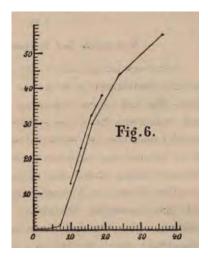
ÄNDERUNGSIMPULS (Sieland & Heyse, 2012):

- > "Irritationen" (Luhmann, 2002
- > "Interventionen" (Petzold, 2007
- "kreative Störungen" (Schratz, 2009)
- > "Stimulierung" (Kruse 2009)

THEORETISCHE GRUNDLAGEN (Modelle):

- Einschleifen-/Doppelschleifen Lernen (Argyris 1999; Argyris & Schön, 1999)
- Assimilation/Akkommodation (Piaget 1948; 1973; 1974)
- Änderungsgesetz nach Lewin (1947)

"Eine Lernkurve stellt den Zusammenhang zwischen dem Erfolgsgrad des Lernens einer Aufgabe und der darauf verwendeten Zeit graphisch dar. Die Lernkurve wird über den Quotienten aus Lernertrag (Stoffmenge) und Lernaufwand (Zeit) berechnet." (Krapp & Weidemann 2004)



"Learning plateau is a long flat and horizontal stretch in the learning curve, which represents a stationary stage, where apparently no progress in learning is recorded. A plateau in learning represents a period in a learning process where no improvement occurs even with any number of practice." (Glenn 1993)

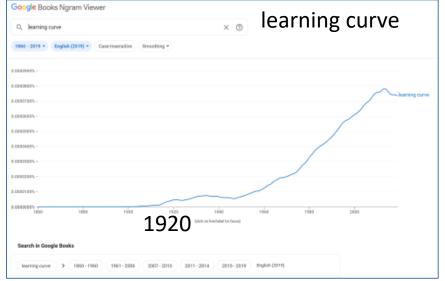
In der Lernpsychologie bezeichnet man den flachen Verlauf in einer Lernkurve, in welcher der Zusammenhang zwischen Übungszeit und Lernerfolg dargestellt wird, als Lernplateau, auf dem für einen gewissen Zeitraum der Lernfortschritt stagniert. Die Lernkurve steigt in diesem Fall also nicht weiter an und verläuft nahezu waagrecht. Eines solche Plateaubildung tritt vor allem beim Erwerb komplexer psychischer Fertigkeiten und beim Erlernen bzw. Üben motorischer Fertigkeiten [...]. Manchmal kommt es in der Lernkurve danach zu einem umso steilerer Anstieg, der auf latente Prozesse während der Plateaubildungsphase zurückgeführt werden kann, den man als Übungseffekt bezeichnet. Ein solcher Lernstillstand kann aber auch ein Hinweis auf individuelle Leistungsgrenzen eines Menschen sein, bei dem auch ein Motivationsverlust in Betracht gezogen werden sollte. Lernplateaus können daher auch eine Lernblockade zur Folge haben, wenn sich trotz Übens kein Lernfortschritt mehr einstellt.

Stangl, W. (2022, 21. September). *Lernplateau – Online Lexikon für Psychologie und Pädagogik*. https://lexikon.stangl.eu/16752/lernplateau.

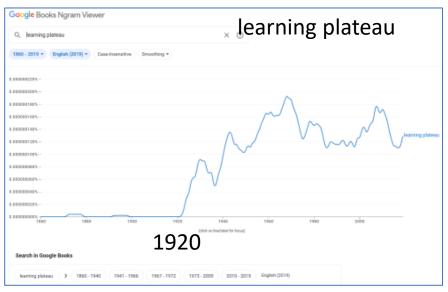
Überwinden → Plateau

Grenze → Asymptote

Google Ngram

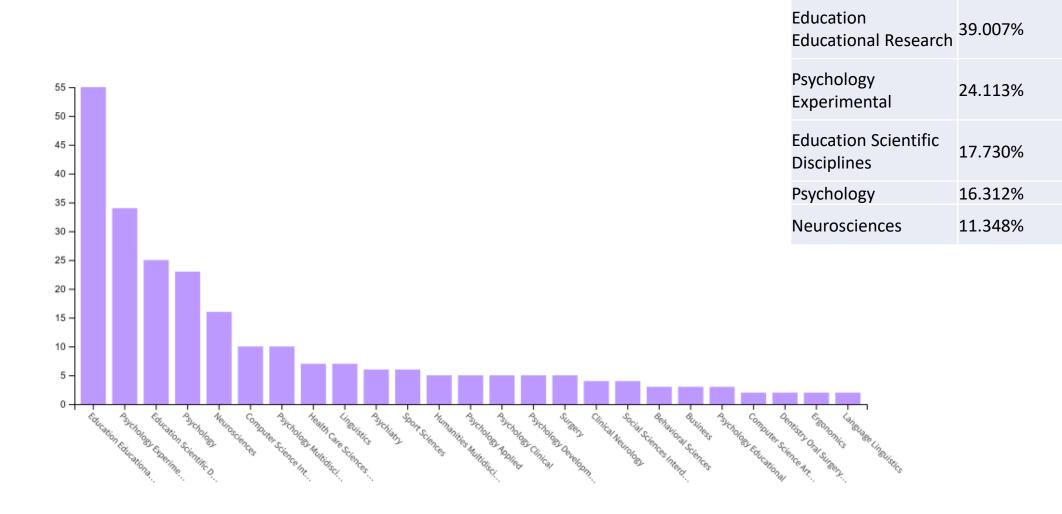








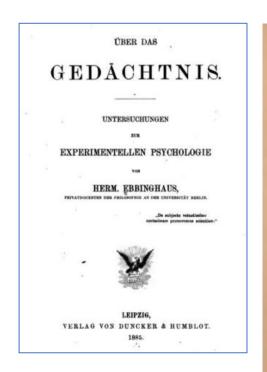
Web of Science Analysis



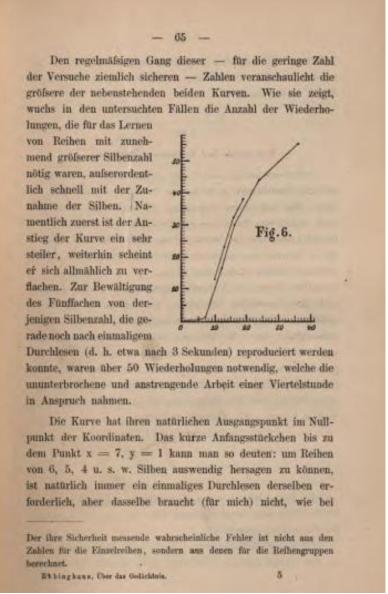
Herkunft ...



Hermann Ebbinghaus (1850-1909)



- deutscher Psychologe
- Pionier der kognitiv-psychologischen Forschung
- experimentelle Gedächtnisforschung
- ➤ Lern- und Vergessenskurve
- Wegbereiter der empirische Lehr-, Lern- und Bildungsforschung.



STUDIES IN THE PHYSIOLOGY AND PSYCHOLOGY OF THE TELEGRAPHIC LANGUAGE.

BY PROFESSOR WILLIAM LOWE BRYAN AND MR. NOBLE HARTER.¹

Indiana University.

In March, 1893, Mr. Harter began at the Psychological Laboratory of the Indiana University a study of certain problems connected with the acquisition of the telegraphic language. Eleven months were spent at and away from the University in a preliminary study of these problems, in the light of his own experience, and by diligent, personal cross-examination of thirty-seven operators, employed by the Wabash Railway Company and by the Western Union Telegraph Company. Of these, seven were recognized as experts, twenty-two as men of average experience and ability, while eight had barely enough skill to hold their places. Twenty-eight of the number had been personally known to H. from two to sixteen years. Throughout these and the subsequent investigations, the mem bers of the telegraphic fraternity showed the most cordial interest and readiness to help.

In March, 1894, H. began at the University Laboratory, an experimental study of individual differences in telegraphic writing. The experimental part of this study continued until August, 1894, and the study of the results until June, 1895. A review of certain phases of the results was made in January, 1896. During the winter of 1895–96 he was engaged with the study of the curve of improvement in sending and receiving.

II. THE PRELIMINARY STUDY.

The first year's work was in the nature of an exploring expedition in search of the problems which would repay fuller in-

³ N. H., a graduate student of Psychology at Indiana University, was for many years a railroad telegrapher, and is an expert in that branch of telegraphy. The experiments were made under Professor Bryan's direction.

94

Bryan, W. L., & Harter, N. (1897). Studies in the physiology and psychology of the telegraphic language. Psychological Review,4(1), 27–53. doi:10.1037/h0073806

Vol. VI. No. 4.

July, 1899.

THE PSYCHOLOGICAL REVIEW.

STUDIES ON THE TELEGRAPHIC LANGUAGE. THE ACQUISITION OF A HIERARCHY OF HABITS.

> BY PROFESSOR WILLIAM LOWE BRYAN, University of Indiana; AND SUPERINTENDENT NOBLE HARTER, Witness, Indiana.

> > Ι.

THE PSYCHOLOGY OF AN OCCUPATION.

A field for research is offered in the psychology of occupations. The chief engagement of every one is the acquisition or exercise of one or another association of habits, such as constitutes skill in a game, trade, profession, language, science or the like. With a little license one may call all of these occupations. In mastering an occupation, doubtless the whole man is involved, body and mind, sensation and movement, thought, interest, imagination, will,—innumerable known and unknown aspects of our psycho-physical life.

It might be argued that such an affair is too complex for scientific treatment until we have done with more elementary things, the fusion of ideas, the psycho-physic law, the chemistry of the cell, or whatever may be still more elementary. In reply, it may be said that the history of science justifies the study of concrete facts, however simple or complex, whether or not the results can at once be correlated with other facts and theories. One studies microscopically, another macroscopically. One studies the chemistry of the cell, another tone sensations,

Bryan, W. L., & Harter, N. (1899). Studies on the telegraphic language: The acquisition of a hierarchy of habits. Psychological Review,6(4), 345–375. doi:10.1037/h0073117



Edward Lee Thorndike (1874 - 1949)

It seems to me therefore that mental training in schools, in industry and in morals is characterized, over and over and over again, by spurious limits— by levels or plateaus of efficiency which could be surpassed. The person who remains on such a level may have more important things to do than to rise above it; the rise, in and of itself, may not be worth the time required; the person's nature may be such that he truly cannot improve further, because he cannot care enough about the improvement or cannot understand the methods necessary. But sheer absolute restraint—because the mechanism for the function itself is working as well as it possibly can work—is rare. (Thorndike, 1913, p. 181)

It appears likely that the majority of teachers make no gain in efficiency after their third year of servi-ce, but I am confident that the majority of such teachers could teach very much better than they do.
[...]



Even in a game where excellence is zealously sought, the assertion that "I stay at just the same level, no matter how much I practice" probably does not often mean that the individual in question has really reached the physiological limit set for him in that function. (Thorndike, 1913, p. 179)

Aktualität & Forschungsstand

Milstein, M. (1990). *Plateauing: A growing problem for educators and educational organi-zations.* Teaching & Teacher Education. Vol. 6, No. 2. pp. 173-181. 1990

Farrell, Th. (2014). 'I feel like I've plateaued professionally ... gone a little stale': mid-career reflections in a teacher discussion group. Reflective Practice, 15:4, 504-517

Zwart, F.S., Vissers, C., Kessels, R. & Maes, J. (2019). *Procedural learning across the lifespan: Asystematic review with implications for atypical development*. Journal of Neuro-psychology (2019), 13, 149–182©2017 The British Psychological Society

Howard, R. W. (2020). *Mapping the outer reaches of the learning curve: Complex intellect-tual skill performance after decades of extensive practice.* Acta Psychologica. Volume 209, September 2020, 103135

Shin, S., Mercer, S., Babic, S., Sulis, G., Mairitsch, A., King, J. & Jin, J. (2021). *Riding the happiness curve: the wellbeing of mid-career phase language teachers.* The Language Learning Journal, DOI: 10.1080/09571736.2021.1979632

Gray, W.D., Banerjee, S. (2021). *Constructing Expertise: Surmounting Performance Plateaus by Tasks, by Tools, and by Techniques.* Topics in Cognitive Science 13 (2021) 610–665© 2021 Cognitive Science Society LLCISSN: 1756-8765 onlineDOI: 10.1111/tops.12575

Bereiche: Sport, Musik, Spracherwerb, Mathematik, ..., Modellierung, ...

Rahman, R., Gray, W.D. (2020). *SpotLight on Dynamics of Individual Learning*. Topics in Cognitive Science 12 (2020) 975–991

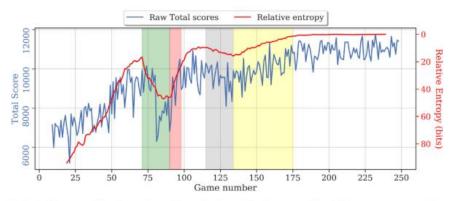


Fig. 2. Performance of our best player, Player 7, through Total score and its relative entropy curve. Green and gray regions denote two dip periods; red and yellow regions show the two leaps that follow the dips.

Gray, W.D., Lindstedt, J.K (2017).

Plateaus, Dips, and Leaps: Where to Look
for Inventions and Discoveries During
Skilled Performance. Cognitive Science 41
(2017) 1838–1870

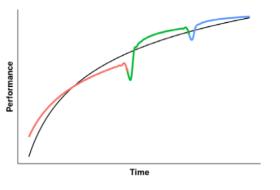


Fig. 4. Notional plot of a succession of three performance curves separated by dips and leaps.

Abfall und Sprung

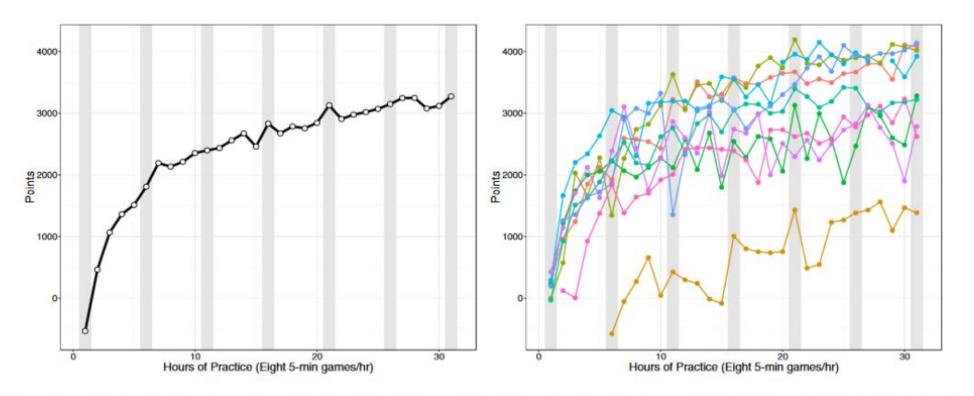
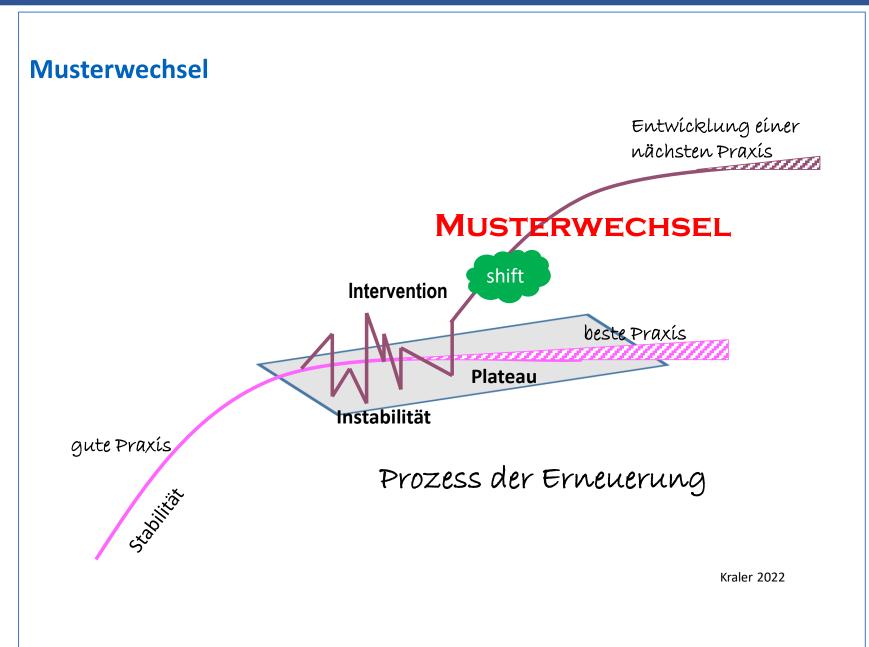


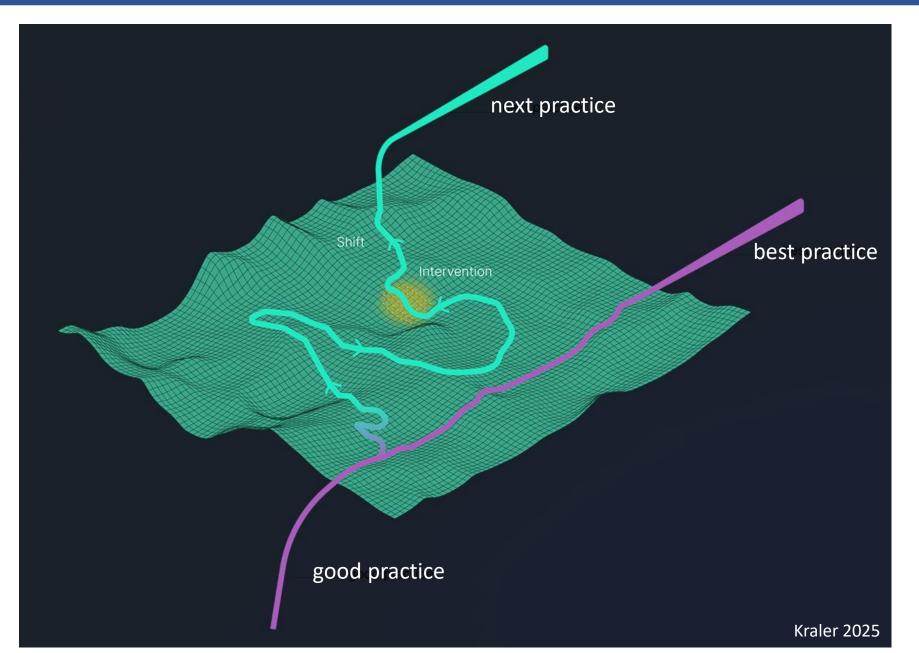
Fig. 8. Contrast between growth in performance averaged across all players (left plot—showing the black line with white dots) and variability in the growth of individual performance (right plot—colored lines with colored dots). Data come from nine people who played Space Fortress (Donchin, 1995) for 31 h (eight games per each hour, no more than 1 h per day). Note that to better highlight the plateaus, dips, and leaps in individual data, we truncated the range of the y-axis to -600. (From Destefano & Gray, 2016.)

Quelle: Gray, W.D., Lindstedt, J.K (2017).

Modell ...

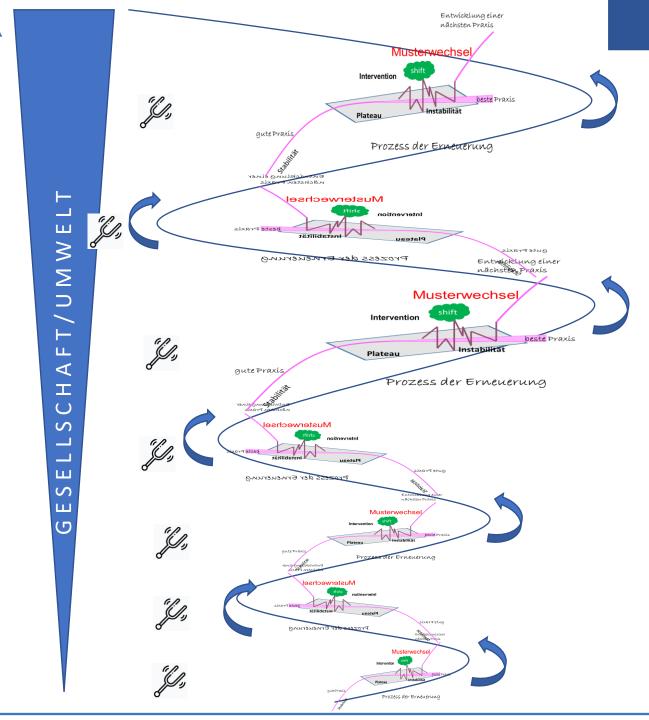


-> Bedeutung des Plateaus!
 (Stille Phasen, Phasen scheinbaren Stillstands, des äußerlichen Stillstands)



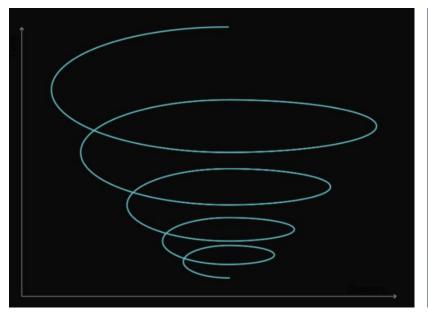
Scheinbares Lernplateau als

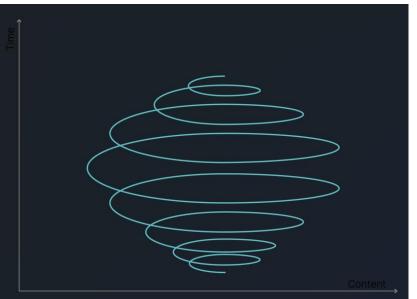
- 1) Setzung & Vertiefung des Gelernten VERNETZUNGSPHASE
- 2) Topographie des Plateaus als konstitutive ERKUNDUNGSPHASE



- resonatives Spiralmodell*
- ➤ Individuum, Gruppe, Institutionen/Organisationen
- > Interdisziplinär

^{*} Konische Spirale mit variabler Steigung





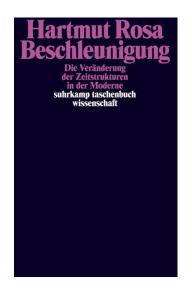


Wachsende bzw. sich stabilisierende Lernspirale

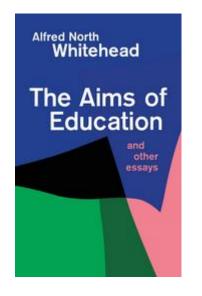
Vergessensspirale

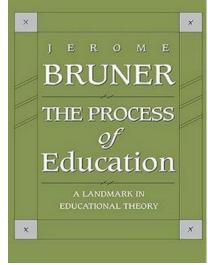
transformatorische Spirale

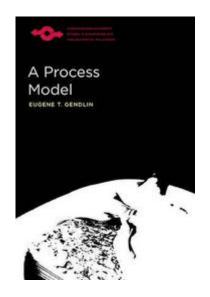
THEORETISCHER RAHMEN



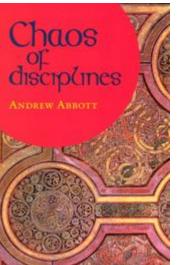








- Whitehead, Bruner, Gendlin (Prozess)
- Rosa, Latour (Gesellschaft)
- Abbott (Selbstähnlichkeit), Mittelstrass (Transdisziuplinarität)
- Kipp-Punktprinzip & Transformation



PROJEKTE:

- Theoretische Fundierung
 - → Whitehead, Bruner, Gendlin, Latour, ...
- Selbstbegleitetes Singen (gem. mit Mozarteum)
 - → Lernen auf Individualebene
- Technologische Gesellschaftsbilder der Nachkriegszeit
 - → Kollektives Lernen
- Entwicklung der Lehrer:innenbildung
 - → Organisationales Lernen
- Ideengeschichte der Vorsokratiker
 - → Wissenschaftstheorie/Geschichte

HERZLICHEN DANK FÜR DIE AUFMERKSAMKEIT!