Hattie, John. (2008) Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement

"This book is the result of 15 years research and synthesis of over 800 meta-analyses on the influences on achievement in school-aged students pre-K through college. The research involves many millions of students and represents the largest ever evidence-based research into what actually works in schools to improve learning. Areas covered include the influence of the student, home, school, curricula, teacher, and teaching strategies." Some of these are influences we can control and some are not.

An important point Hattie makes is that *almost everything works*. Very few interventions designed to improve learning harm learning. Furthermore, one can expect a certain level of improvement in learning simply due to natural maturation (about .10 per year), which is one reason why virtually every intervention appears to "work." Hence we end up pouring time and money into interventions that do "work" but don't give the return on investment other interventions could. His point is, then, why wouldn't we just focus on those interventions that have more than an average effect on learning? Hattie found that the average effect size of all the interventions he studied was 0.40. Therefore he decided to judge the success of influences relative to this 'hinge point' in order to find an answer to the question "What works best in education?" He feels that as educators we should focus on interventions we can control with effect sizes above .40 and focus especially on those with the highest effect sizes. Remember that an effect size of 1.0 or above is HUGE.

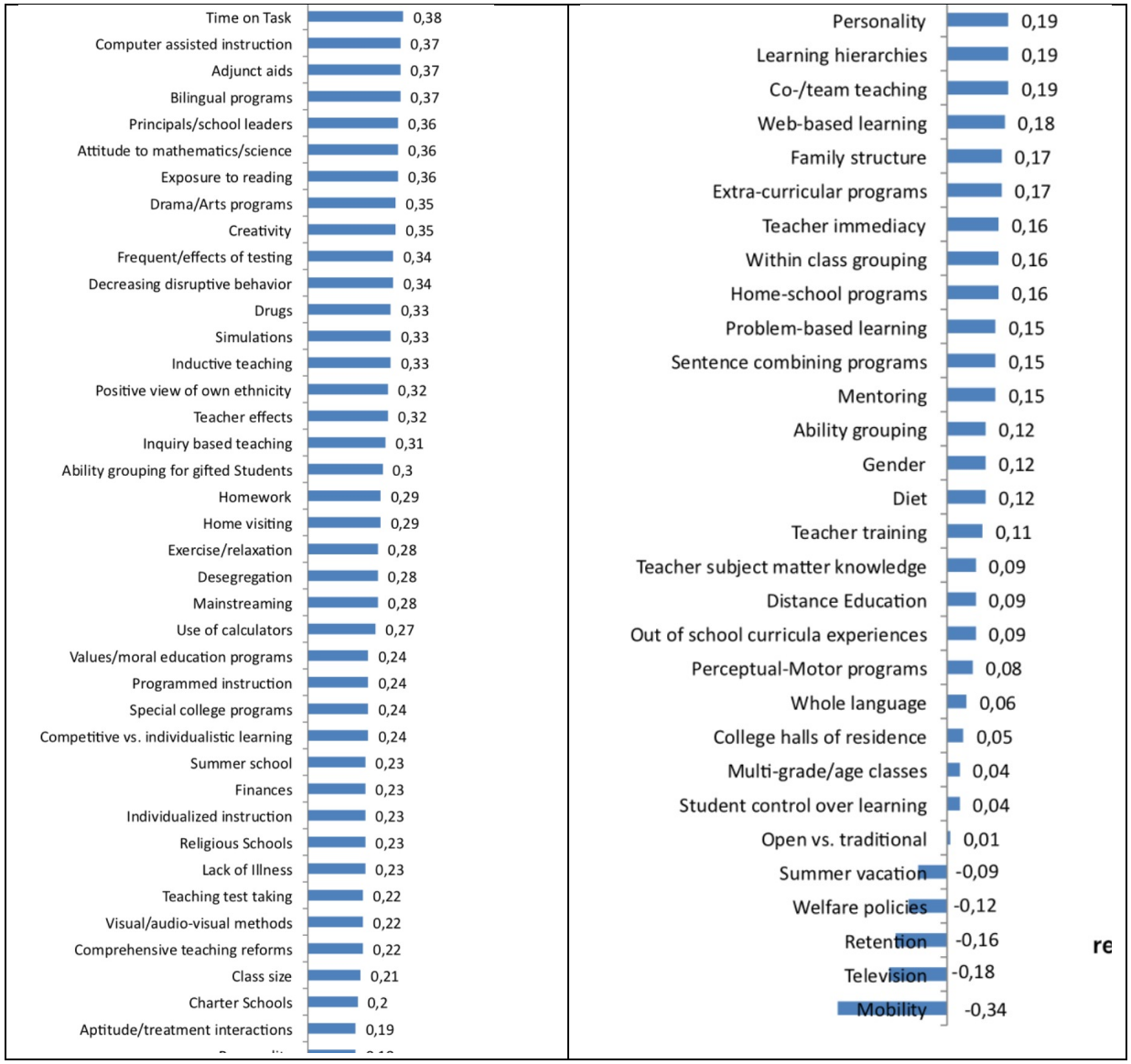
Effect size	Influence	Locus of control	Explanation
1.44	Student expectations	Student	How well students *believe* they will do is a strong predictor of how well they will actually do. This can have a positive or negative effect.
1.44*	**Promoting positive student expectations**	Teaching*	One can predict that student learning will be increased when teachers explicitly promote a "growth mindset" and include activities that help students recognize their expectations for their learning and how that affects their learning. (Research supports this assertion although the exact effect size is not known.) See articles by Carol Dweck.
0.90	**Formative Assessment**	Teaching	According to Hattie (2012) and Black & Wiliam (2001) **formative evaluation** refers to any activity used as an assessment of learning progress before or during the learning process itself. In contrast with formative assessment, the summative assessment evaluates what students know or have learned at the end of the teaching, after all is done.

?*	Ability to persist	Student	A students' ability to persist is considered one of the strongest predictors of how much they will learn. As this is a new area of study, it was not included in Hattie's meta analysis, but the results of recent studies would suggest that it should fall close to the top of this list.
?*	Ability to persist	Teaching*	One would assume that since students' ability to persist is considered one of the strongest predictors of how much they will learn that if we could develop strategies to improve persistence, those would have a significant effect. Tested strategies do not yet exist.
.75	Teacher clarity	Teacher	What are some means you could use to measure your own clarity and/or improve it?
.73	**Feedback**	Teaching	
.72	**Student-teacher relationships**	Teacher	
.71	Spaced vs. mass practice	Teaching	Spiraling back to review and practice previously learned concepts
.69	Metacognitive strategies	Teaching	Teaching students to "learn how to learn" and reflect on both their learning and the strategies they employ
.67	Prior achievement	Student	
.66	Curricula to promote creativity	Teaching	
.64	**Self-verbalization, self-questioning**	Teaching	Teaching students how to ask themselves questions effectively as they work and talk themselves through complicated processes
.64	Homework*	Teaching	This effect size singles out high school and college students. The effect is much lower for primary and middle.
.62	Professional development	Teacher	Think of the effect GTF is having on you and your students!
.61	Not labeling students	Teacher	
.60	**Teaching strategies**	Teacher	The effect size of each increase in a teacher's knowledge about a variety of teaching strategies and matching those strategies to desired outcomes
.59	**Cooperative vs. individualistic learning**	Teaching	
.59	Study skills	Teaching	
.59	**The Engelmann Cycle**	Teaching	
.58	Comprehension programs	Teaching	The best known of these programs is probably Ellin Oliver Keene

.58	Mastery learning	Teaching	Programs in which students do not move on until they have mastered the current concepts.
.57	Worked examples	Teaching	
.57	Home environment	Outside	
.57	Socio-economic status	Outside	
.57	**Concept mapping**	Teaching	
.55	Peer tutoring	Teaching	
.54	Pre-term birth weight	Outside	
.53	Peer influences	Outside	
.52	Classroom management	Teaching	
.51	Parental involvement	Outside	
.49	Small group learning	Teaching	
.48	**Engagement**	Student	
.48	Motivation	Student	
.47	Early intervention	Outside	
.46	**Quality questioning methods**	Teaching	A combination of what types of questions are being asked (a higher percentage of critical thinking questions is preferable) and how the questions are asked (methods that engage more than one student at a time are preferable)
.45	Preschool programs	Outside	
.43	Teacher expectations	Teacher	
.43	School size	Outside	
.43	Self-concept	Student	
.41	Matching style of learning	Teaching	This is the idea of learning styles, multiple intelligences, etc. These are important concepts to be aware of but programs focused on matching a student's style to the method of teaching haven't shown unusually impressive results.
.40	Social skills programs	Teaching	
.40	Reducing anxiety	Teaching	

*Cynthia's predictions based on the teaching recommendations that would be the obvious corollary to certain student characteristics

Below the hinge-point:
interventions and characteristics which have an effect size below the average



More on the concept of effect sizes from Hattie himself…

"An effect-size provides a common expression of the magnitude of study outcomes for all types of outcome variables, such as school achievement. An effect-size of 1.0 indicates an increase of one standard deviation, typically associated with advancing children's achievement by one year, improving the rate of learning by 50%, or a correlation between some variable (e.g., amount of homework) and achievement of approximately .50. When implementing a new program, an effect-size of 1.0 would mean that approximately 95% of outcomes positively enhance achievement, or average students receiving that treatment would exceed 84% of students not receiving that treatment. Cohen (1977) argued that an effect-size of 1.0 would be regarded as large, blatantly obvious, grossly perceptible.

For example, it was possible to locate 31 meta-analyses, 17,952 studies, and 352 effect-sizes studies that investigated the effects of introducing computers on students' achievement (see Hattie, 1986). Using meta-analysis, these effects can be statistically synthesized to ascertain an overall effect as well as assessing the influence of differing groups of students (e.g., males versus females), different uses of computers, subject areas, and so on. The average effect-size across these 557 studies was .31. Thus, compared to classes without computers, the use of computers was associated with advancing children's achievement by approximately three months, improving the rate of learning by 15%, about 65% of the effects were positive (that is, improved achievement), thus 35% of the effects were zero or negative, and the average student achievement level after using computers exceeded 62% of the achievement levels of the students not using computers. An effect-size of .31 would not, according to Cohen (1977), be perceptible to the naked observational eye, and would be approximately equivalent to the difference between the height of a 5'11" and a 6'0" person.

Of course, this is only an overall effect-size from introducing computers, although contrary to many beliefs the variability around these effects is quite small. There are many important moderators. For example, the effects decrease with age: primary students gain most (effect-size = .48), secondary students have medium gains (effect-size = .32), and college and university students gain least (effect size = .25); there are differences in effect-sizes on achievement between males and females in secondary but not elementary classes (see Fitzgerald, Hattie, & Hughes, 1985; Hattie & Fitzgerald, 1987). Compared to not having computers in schools (effect=0) computing can help."
- From Hattie's Inaugural Lecture at the University of Auckland

Another well-known "meta-analysis of meta-analyses" is from Robert Marzano (2001). His team focused exclusively on teaching strategies. This table summarizes their results.

Categories of Instructional Strategies That Affect Student Achievement

Category	Ave. Effect Size (ES)	Percentile Gain	No. of ESs	Standard Deviation (SD)
Identifying similarities and differences	1.61	45	31	.31
Summarizing and note taking	1.00	34	179	.50
Reinforcing effort and providing recognition	.80	29	21	.35
Homework and practice	.77	28	134	.36
Nonlinguistic representations	.75	27	246	.40
Cooperative learning	.73	27	122	.40
Setting objectives and providing feedback	.61	23	408	.28
Generating and testing hypotheses	.61	23	63	.79
Questions, cues, and advance organizers	.59	22	1,251	.26