Hattie Visible Learning

About - 800 meta analysis - 50k studies. All focused on achievement in school students. Every meta analysis shown on the same scale using effect sizes.

Effect Sizes (d) -

- An effect size of 1 is one standard deviation on the outcome, i.e. advancing children's achievement by 2-3 years. i.e. the difference between a person at 5'3'' and 6'0''.
- An effect size of 0.29 is the difference between a person at 5'11'' and 6'0''.

General Comments on Studies -

- Everything seems to work. The average effect size in this book is 0.4
- Teachers have an average effect size of 0.2 to 0.4. Untaught students still have a significant effect of between 0 and 0.15 hence effects in this region are potentially harmful.

Overall Message

- Have an explicit goal that is clear for the teacher and the learner.
- Appropriate difficulty - the student should think it is difficult (challenging) but possible.
- Feedback given and sought both by the teacher and the students.
- Active, passionate, engaging people.

The teacher must know when something is not working (related to the outcome) and try something else. There must be an environment where making and correcting errors is welcomed as a part of trying.

General Points:

- If a child is not engaged in learning then they will not learn. Not having disruptive students will greatly impact this for the entire class. There can be significant effects relating to this caused by the home or playground environment.
- Help them attribute success to factors such as effort rather than ability.
- The effects of the school are often overplayed: class sizes, school uniforms, summer schools.
- A teacher's view of students ability is a self fulfilling prophecy.
- Students are good judges of their own and their teachers performance.

Types of Understandings

Revision of Bloom's Taxonomy

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1. **Factual** (Shallow) - facts and ideas.
2. **Conceptual** (Deep) - compare and generalise. Understand relationships between facts and ideas.
3. **Procedural** (Process) - performing a task.
4. **Meta Cognitive** - learning about learning and your ability.

The Student

- Openness and willingness to invest in learning is a major factor here and is partly determined by factors outside the classroom but it can be influenced by teacher and should be a goal of teaching.
- The measure of ability at 22 months was a good predictor of achievement at age 26.
- Personality types is a small effect but people in happy moods can solve complex tasks better and faster.
- Allocating time away from other subjects to physical education did not detract from achievement in other subjects.
- Drugs reduce behaviour problems in children with ADHD, when behaviour problems are reduced students are more likely to be attentive, when a student is attentive they might learn. Hence drugs are great for behaviour but not that great for achievement.
- Low to non-substantial effects of gender, diet and exercise.

The Home

“The home can be a nurturing place for the achievement of students or it can be a place of low expectations and lack of encouragement in learning.”

- parents can learn to assist the children in attending to and engaging in learning.
- home environment with high correlation of achievement: maternal involvement, variety and play materials
- television, single vs. two-parent families, divorce, adopted vs. not, maternal employment, having or not having siblings are all small effects relative to other influences.
- parental involvement is a big factor,
    - negatively correlated if it involves a surveillance approach, or external rewards, or punishment.
    - parent aspirations were the most important influence on their children's’ achievement

The School

“If you take two students of the same ability, it matters not which school they attend, but it may matter greatly who their teacher is. … schools are only effective to the extent that they have effective teachers … the situation is different in less resourced nations”

- “There is no consistent statistical relationship between educational expenditure and measures of student performance.”
- Moving students from one school to another is a noticeable negative effect - mostly from peer effects.
- Small effect sizes for various different types of school, summer schooling, living in halls or not, a summer vacation, out-of-school curriculum, school-uniforms or not, classroom size, grouping students by ability, single sex classes.
- good principals (school leaders/headmasters) have a focus of create a disruption free learning environment, clear teaching objectives, and high expectations. And especially a safe environment for teachers to critique, question and support other teachers.
- assigning a task to a small group seems to be a good way of teaching.
- keeping the student back a year has a clear disadvantage. “The only question of interest relating to retention is why it persists in the face of such damning evidence.”
- moving gifted students up a year has a clear significant advantage. “accelerated students did just as well as the bright students in the grade into which they moved” there is even positive social effects.
- The climate of the classroom has a major effect
    - the teacher should have the ability to identify and quickly act on potential behavioural problems as well as indicate what behaviour is appropriate.
    - Clear well states expectations, goals and rules are important for the teacher to have.
    - The presence of one disrupting student can change the climate and significantly reduce the desire to learn for all students. Hence reducing disrupting behaviours needs to be a core competency of any successful teacher.
- The effects of a student’s peers is considerable. They have a major role of setting expectations of learning or not learning. They provide emotional support, and rehearsal/practice opportunities.

The most powerful effects of the school relate to the climate of the classroom, peer influences and a lack of disruptive students.

The Teacher

“within school factors, in particular teacher quality, account for a much larger variance than between-school factors. … having poor teachers can be devastating”

- “The effect of four-year college training compared with … emergency licenses is 0.14” This is very small. There is even a randomised control trial on this showing the same.

- Mircoteaching is a fantastic way to improve teachers teaching ability. This is where you teach a mini-lesson to a small group (often in a lab) then engage in post discussion including videotaping for later analysis.
- Having alternative strategies to try to teach the material is an important thing for a teacher.
- Exemplary teacher education programs (basically the same as exemplary student programs):
    - a clear vision of good teaching
    - well-defined standards that guide evaluation
    - extended practice (practical rather than theoretical)
    - strong personal relationships
    - it must challenge teacher conceptions about learning
- A small effect size for the domain specific knowledge of the teacher: “A very low effect size d=0.12 for knowing mathematics and student outcomes.”
- A medium effect size for years of teacher experience, number of education courses taken and student teaching grade.
- Intellectual ability may be more powerful than teacher training. Especially the teachers verbal ability. “knowledge, empathy and verbal ability all need to be present”.
- Students are good at rating their teachers accurately and student rating of teachers correlates (r=0.43) with student performance..
- Teacher must challenge students and have high expectations. They must get the students to evaluate their own work, students are good at this. Expectations were powerful influencers on the success of student learning.
- Difference between board certified teachers and non:
    - Setting appropriately challenging goals
    - Teachers tested hypothesis about who works for them teaching
    - A sense of control
    - A passion for teaching
- Student-teachers relations has a large effect size (d=0.72).
- Attractive people are perceived as more intellectually competent
- Teachers must stop over emphasising ability and focus on progress. Adopt the mantra “Be prepared to be surprised”. Labeling of students e.g. “they have learning-difficulties” is bad.
- It is hugely important for teachers to communicate the intention of the lessons and the notions of what success means. Clarity of speech is a prerequisite for this.

Initial teacher training programs may have little impact on how well those teachers influence their students achievement. It is difficult to find evidence that subject matter knowledge is important it may be that teachers have an acceptable levels hence it not making a difference. Demonstrating to all students that they care about their learning is both powerful and effective.

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The Curricula

“It is less the content of the curricula that is important than the strategies teachers use to implement the curriculum.”

- A teacher using the whole language method need to be at least 10 times as effective as one using phonetics to obtain the same outcomes.
- In maths providing feedback data or recommendations is good, emphasising real world examples is bad (for achievement)
- Again recommends keeping the students aware of the objectives and how they are progressing towards them.
- Social skills training was good for enhancing peer relations in the short term. Hence if included it should be regular and sustained. They would be of much benefit to the outcomes of schooling.
- Play is important for student achievement, large effect size!
- Creativity programs have an even larger effect size. This seems to be hinting towards meta-cognitive strategies such as strategic and reflective thinking being hugely important. With the important note that these should be taught not as as separate subject but as part of teaching something that is useful in its own right.
- Example of a successful program (in outdoor education):
    - emphasised very challenging learning intentions. (e.g. abseiling for the 1st time)
    - the success criteria are clear (e.g. get to the bottom safely)
    - peer support is optimised (e.g. friends cheering you on)
    - feedback is actively sought and given throughout. (e.g. asking “am I clipped in properly”)
- For students there is a need to identify and eliminate misconceptions.

The Teaching Approaches Part 1

- Exemplary school:
    - emphasised engagement in learning
    - teachers articulating various strategies for instruction
    - teachers sought feedback about their teaching from the students
    - optimally challenging tasks
- Not all students in the class will be working at the same level so it is important to adapt the learning intentions.
- Implementation intentions (see Gollwitzer) and goal types (see Dweck) are very important

- Set challenging rather than “do your best” goals. Yet the goal should not be so difficult that it is seen as unattainable by the student given their level of competency and self-efficacy (self-belief).
- Developing a graphical representation of the conceptual structure of the course is a big win. It seems not to matter who makes it - teacher or student. Basically make a mind map and give it to the students.
- Give the students the marking criteria.
- Mastery learning is very powerful. It is based on small units of well defined sequenced outcomes. A student does not progress until they finish the unit - no student progresses until the unit is mastered. Each unit is preceded by brief diagnostic tests.
- Providing a student with worked examples is another clear winner.
- “feedback was among the most powerful influences on achievement … was most powerful when it was from the student to the teacher”. Basically as a teacher get feedback from your students on how you are doing.
- Praise, punishment and extrinsic rewards are not effective.
- Feedback should address one of the threes questions:
    - where am I going?
    - how am I doing?
    - where to next?
- Repeated testing is useful if the teachers use the results to modify their teaching strategies. It is best to do a larger number of smaller tests that vice versa.
- Teaching test taking has small effect size. Not worth the effort.
- A **massive** effect size of 0.9 for providing formative evaluation of programs. Basically find out what happened because of your teaching (there will be intended and unintended consequences).
- Medium effect size for the amount of time doing the task. If you spend time practicing make it deliberate practice.
- Spaced repetition is great. Students often need spaced repetition (i.e. repeated exposure) for new concepts too.
- The use of peers as co-teachers is overall quite powerful. Especially cross-age tutors. Both sides gain equally from this.
- Yet mentoring somehow had close to zero effect.
- Teaching students metacognition and study skills is a great idea, especially if it is taught in the context of teaching something else. Basically teach them about the stuff in here along with note taking, self-evaluation, how to organise work, when to seek help.
- Reviewing the notes is more important than making the notes and giving students notes to work from is a very good idea.
- Teaching in different ways to different students is not necessary or helpful even if you think they have different learning styles. Teaching various learning strategies to all students yes, making sure they are all enjoying learning, yes, different learning style, no.
- Individual instruction is not a great help. It is basically the same as a classroom. Peer tutoring and computer assisted instruction are both far better for achievement.

Successful teaching is a function of the worthwhileness and clarity of the learning intentions. Both student and teacher need to set challenging goals and have multiple appropriate strategies at their disposal.

The Teaching Approaches Part 2

“pre-planning, deliberate attention to learning intentions and success criteria, and a constant effort to ensure teachers are seeking feedback on how successfully they are teaching their students”

- Teaching deeper strategies is best taught as part of a subject rather than as a subject on its own
- Instructional goals should cover each part of Bloom’s revised taxonomy
- Reciprocal teaching is great. It is where the student takes turns at being the teacher. This makes students check their own understanding by generating questions and summarizing.
- Direct instruction is another fantastic method. It has 7 steps:
    - have a clear goal (what should the student be able to do or understand after this?)
    - both student and teach know the success criteria
    - aim to build commitment and engagement
    - the children must understand before they practice. Teacher shows worked examples. Teachers checks understanding.
    - Guided practice
    - Closure at end used to reinforce the major points
    - independent practice is the final and hugely important part.
- Both cooperative and competitive learning are better than individualistic. Cooperative is better than competitive.
- “if you want to increase student academic achievement give each student a friend” (as long as the friends doesn’t think learning is uncool).
- Comprehensive teaching reforms only really worked when the teachers bought in to the idea.
- Computer aided instruction works best when the normal learning guidelines outline here are followed (allow various different strategies to teach the material, give and seek feedback, use peer learning (pair working), give training on how to use it as a technique)
- Computers are best used as a supplement rather than replacement of the teacher.
- Teachers need to be taught how to effectively use computer to teach before they use them to teach (more than 10 hours intensive training is needed).
- Students need drill and practice and computer seem good at providing that.
- Some students prefer computer feedback to human feedback.
- Computers are not biased like humans can be.
- Multimedia is worthwhile when it portrays addition information or structure rather than just being more pretty.
- Students can experience similar levels of academic success when they learn using telecommunications and when they learn in classroom settings. In both cases the quality

of the teaching matters more. The differentiation in quality of distance learning is how much time the students interacts with peers and teachers.
- Homework is overall positive but mostly for older students.Short frequent homework with good feedback is best. It is important with any teaching, especially when there is no supervision, that the work no be so difficult as to undermine motivation. If there is no active involvement by the teacher then it does not contribute to student learning.

Bringing it all Together

“teachers need to know the learning intentions and success criteria of their lessons, know how well they are attaining these criteria for all students, and know where to go next in light of the gap between students current knowledge and understanding and the success criteria”

- We need to “create a school, staff-room, and classrooms environment where error is welcomed as a learning opportunity”.
- Most of the changes do not need a change in structure or resources. They need a change in the methods at approach to teaching.
- We should set high standards for ourselves as teachers and for our students. d=0.40 for every student every year is a high but achievable goal.
- Teachers and principals need to keep asking “what is working best”. And judged this based on evidence not opinions. Decisions in teaching should be based on evidence far more than currently happens.
- Students need active guided instruction, they need repeated exposure ideally presented in different ways spaced over various days.
- The teachers is largely cut off from information about what is happening in the class having to substitute visual indicators such as attention and quiet instead of actually finding out if they meet the success criteria.
- Working conditions, class sizes, the school you are in the family background of the child, the subject you are teaching, your level of expertise in the subject, the “learning style” of the student all matter very little. The principles of good teaching are the same and the focus should be on quality teaching strategies.
- To create a teaching plan start backwards from the desired results working backwards until you reach the current level of the student.
- Learning involves active involvement, it is primarily a social activity.
- Teachers need empathy. Relationships, trust, caring and safety are all important.
- The rate of learning is a direct functions of goal difficulty.
- The aim is to encourage teachers to construe their teaching in terms of a series of related experimental designs. A key in this (in all science) is disconfirmation - seek evidence to determine what is not working. Lets hope we can make teachers evidence based. Here is an old quote about the study of medicine, lets hope that education makes the same progress but faster:
    - “It is hard to conceive of a less scientific enterprise among human endeavors. Virtually anything that could be thought up for treatment was tried out at one time or another, and, once tried, lasted decades or even centuries before being given

> up. It was, in retrospect, the most frivolous and irresponsible king of human experimentation, based on nothing but trial and error, and usually resulting in precisely that sequence" (Thomas -*the medusa and the snail*- 1979 p.159)

Three principles:

1. challenge intellectual and creative capacities.
2. care with humanity and sensitivity.
3. strive to maximize their later potential.

Summary

Even an untaught student shows significant progress over a year. We need to set a higher standard.

- Have an explicit goal that is clear for the teacher and the learner. Clearly communicate the intention of the lessons and the notions of what success means.
- Appropriate difficulty - the student should think it is difficult (challenging) but possible.
- Feedback given and sought both by the teacher and the students. Students are good at telling when a teacher is bad, use this information. Feedback should address:
    - Where am I going? (overall direction)
    - How am I doing? (current progress)
    - Where to next? (the next step)
- Active, passionate, engaging people. Be clear in what is acceptable and what is not. Having a climate where peers encourage learning is hugely influential, as is the opposite.
- Give the students a mind map overview, clear worked examples and once they understand give them deliberate practice work in small groups. Then get them to evaluate their own, or each other's work.
- Material needs to be presented multiple times in different ways over different days.
- Meta-cognitive strategies (teaching how to learning, note taking, when to seek help, etc) is very important but should be taught as part of the subject not as a subject on its own.
- To become a better teacher video your self actually teaching and watching it back with other teachers with a view to improve.
- Use small regulars test to check what areas you need to improve on as a teacher.