

How to help high achieving students

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High achieving students

Please interrupt!
There may be prizes

Why?

You asked ...

Very little published

1. What do we mean
2. Pros and cons of being high achiever
3. How can we help

1. What is 'high achieving?'

Natural ability 'gifted' v practice / determination / experience

Seehusen defines gifted as 'top 3-5% intellectual abilities, compared with general population'. Would expect lots of medical students to be in this group.

May include high IQ; speed / volume of information processing; curiosity; intuition; new ideas and solutions

1. Strivers – focused, good at tests
2. Superstars – diverse interests, good at most things
3. Independents – may have no desire to please peers or authority.

Which is more important? Which do we value more?

[Seehusen, Miser. Teaching the outstanding medical learner. Fam Med 2006;38:731-5]

1. What is high achieving. What do we value?

Talent bias / 'Halo effect'

Played 2 pieces music to musicians. Same player but told listeners one by 'natural' and one by 'striver'.

Experts especially said hard work important.

All judged 'natural' as better (though was same player).

[Tsay et al. Naturals and strivers: preferences and beliefs about sources of achievement.
<https://psycnet.apa.org/record/2011-03190-012>]

Terman followed up children with high IQ for 35 years.

'professional success' v 'struggling'

IQ similar but struggling had (from young age) lacked determination or persistence. High achievers had perseverance, desire to succeed.

[Terman. 1959. The gifted group at mid-life; thirty-five years follow-up of a superior group. Stanford University Press]

1. What is high achieving? Can we predict?

One US medical school

Pre-admission tests

correlate with pre-clinical performance but not clinical
conscientiousness correlates with most
emotional intelligence, extraversion correlates with clinical performance

[Haight 2012. Associations of Medical Student Personality and Health/Wellness Characteristics With Their Medical School Performance Across the Curriculum. Acad Med. 2012;87:476–485]

One Korean med school. 475 students.

Compared those who had won international competitions in science or maths v others.

‘gifted’ students scored better in early years. Difference faded – no difference by end of studies.

[Kim, Kee. Gifted students’ academic performance in medical school. A study of Olympiad winners. Teaching and Learning in Medicine. 2012;24:128-132]

2. Pros and cons of being a high achiever

Pros:

Cons:

1. For student

Unrealistic expectations (from self and others), bored, oversensitive, struggle with failure, frustrated by conformity and rules, struggle to fit in

2. For Peers

May feel inadequate / intimidated / demotivated / irritated.

3. For tutor

anxiety about own knowledge or skills. **Solution?**

2. Pros and cons

Telling people they are smart

Children in China, America, Canada: told half had a reputation for being smart. Guessing game but had opportunity to cheat.

‘smart reputation’ – **61% cheated** (boys worse). Worse if person doing game was same one who said they were smart.

Others – **41% cheated.**

[Zhao. Telling young children they have a reputation for being smart promotes cheating. Developmental Science. 2017; 21:e12585]

→ Telling people they are smart may add pressure and reduce learning.



‘Twice exceptional learners’ = gifted plus something else, eg neurodiverse.

MAY be curious, creative, good problem solvers, but also appear to process slowly, lack organisational skills, struggle to think linearly or follow instructions.

2. pros and cons

Growth mindset (belief can improve) v Fixed mindset (belief that ability set in stone)
Tracked 500 students over 4 years at Uni.

Growth mindset

- Prioritise learning goals > performance
- Attribute success to effort
- Excited, inspired, enthusiastic about academic performance
- Put in more effort, learn from mistakes
- Better self-esteem

Fixed mindset

- Prioritise immediate performance > learning
- Attribute both success and failure to external factors eg luck
- Give up, feel helpless in adversity
- Lower self-esteem

2. Pros and cons

Lovecky – studied ‘gifted’ adults. Described 5 traits (all positive and negative)

Divergency: unusual, original creative. Challenge stereotypes. May not fit in, may find conformity hard. May not follow social rules. Don't suffer fools

Excitability: productive, lots of energy. Can focus and take risks. Bored easily. May not complete ideas.

Sensitivity: empathy/ committed/ tohcy / intense / vulnerable. Passionate but may not appreciate that others less passionate.

Perceptivity: view multiple layers / angles of a situation. Can assess people and situation rapidly. May dislike social facades, falsehoods

Entelechy (=having a goal): may be attractive to others, create deep feelings. May get overwhelmed by demands of others.

[Lovecky. Can you hear the flowers singing? Issues for gifted adults. Journal of Counseling and Development. 1986;64: 572-575]

3. How can we help the high achieving student?

Vygotsky's Zone of Proximal Development (or Potential Development)

Current ability → ZPD (with help) → potential new level

Dynamic (as develop)

Individual (even from same level)

Open-ended (problem solving not just procedures / facts)

Collaboration – shared goal

Internalise knowledge

Scaffolding = active understanding through discussion

Contingency = responsive. Right amount of help at right time.

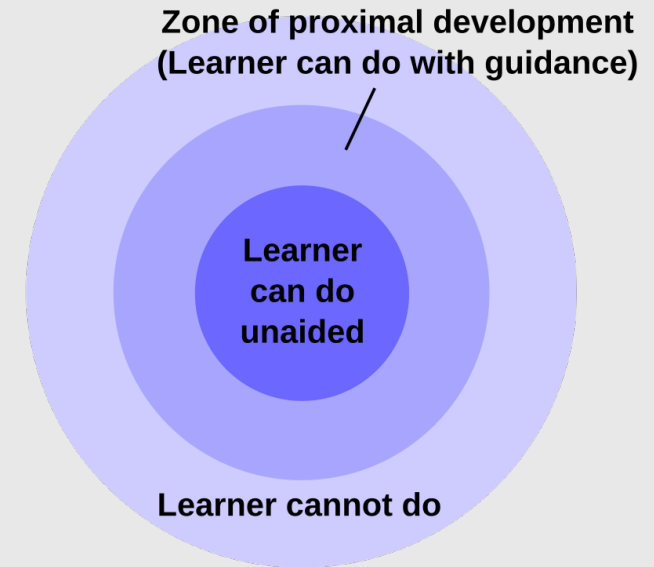
Fading – gradually reduce support when no longer needed.

Modelling – think aloud while solving problem

Justification = explain why

Inquiry based – student's own questions

What patterns do you noticed? How might this apply to other situations? How does it relate to what you knew?



[McLeod. 2024. Vygotsky's Zone of Proximal development . <https://www.simplypsychology.org/zone-of-proximal-development.html>]

3. How can we help. Vygotsky ZPD contd

Interaction (**scaffolding**) v self-directed learning with feedback at end?

Doll's House experiment.

Young children. Task = organising miniature furniture into correct rooms in the house.

Phase 1. Alone. Phase 2. with mum or with feedback at end. Phase 3. Alone.

Different room combinations each time → learning principles not just memorising.

	Before	After
3 y feedback	0.41	0.36
3 y interaction	0.46	0.70
5 y feedback	0.51	0.64
5 y interaction	0.52	0.94

$P < 0.01$

[Freund. 1990. Maternal Regulation of Children's Problem-solving behavior and its Impact on Children's Performance. Child Development; 61,:113-126.
<https://www.jstor.org/stable/1131052>]

3. How can we help. Vygotsky.

But also – better to watch an expert or fumble along?

Thoughts?

?see one, do one, teach one?

Adults watched videos of experts (tablecloth trick, moonwalking, darts, video game, juggling). At end did task.

Watch or fumble along?

Watching more times → increased confidence, but not ability (may worsen).

Reading or thinking about task did not (falsely) increase confidence.

Sensory experience (just holding juggling pins) reduced false confidence

One must learn by doing the thing; though you think you know it, you have no certainty until you try. —Sophocles (~500 BC/2015)

Dunning Kruger effect

[Kardas, O'Brien. Easier seen than done: merely watching others perform can foster an illusion of skill acquisition.

<https://journals.sagepub.com/doi/abs/10.1177/0956797617740646>]

Implication for practice?

3. How can we help

What should we do to challenge / stimulate high achieving students?

What can we do to help?

More challenging cases

Management (not just history)

Counter-intuitive knowledge, cognitive dissonance

Develop independent lifelong learning skills

Collaborative – learn together

Be open about limits of our own knowledge

Get them to teach others or explain something to a patient

Discuss ‘what if’

Ask them what interests them

Discuss hard concepts / transformational ideas

Beware of just giving praise (doesn't improve performance)

Examples of hard concepts

What is hard? What did you or others find hard when learning?

uncertainty; doing nothing; leaving out questions; empathy;
breaking rules; complex or conflicting situations;
summarising; chaos.

Hard concepts: What to leave out (history / exam / investigations)

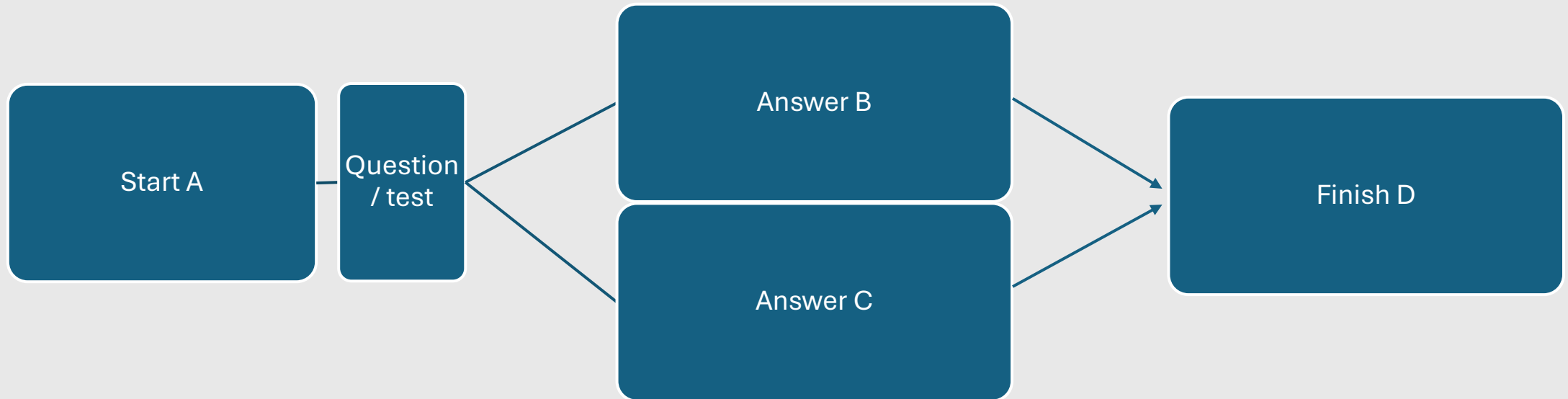
“I always listen to what I can leave out’

Miles Davis

“In music, silence is more important than sound”

“Silence is sometimes the best answer”

Dalai Lama XIV



Hard concepts: Empathy

“Never judge a man until you have walked a mile in his mocassins” (Native American proverb)

“If you can learn a simple trick... you'll get along a lot better with all kinds of folks. You never really understand a person until you consider things from his point of view... until you climb into his skin and walk around in it”

Atticus to Scout in ‘To Kill a Mockingbird’ (Harper Lee)

Think of point of view of patient, colleagues, especially those less advantaged (ability, education, opportunity etc)

Hard concepts: Do Nothing

‘Doing nothing is not an option’? (often the best option?)

Eg ...

Requires thinking ahead – what are we trying to achieve here? Who am I trying to help with this investigation / treatment etc?

Hard concepts: unpicking guidelines (rule breaking)

Any thoughts:

Hypertension treatment (diuretics, black people, alpha-blockers)

Heart failure diagnosis

Heart failure treatment (gliflozins)

Paracetamol or ibuprofen for febrile children

Clopidogrel or aspirin for stroke

Unlicensed medicines

Pulsatile tinnitus

Restless legs

Teaching others

Good evidence that students (tutees) can benefit from near-peer tutoring. How do tutors benefit?

Students learnt some material then randomised to:

1. Peer tutor another student (explain, discuss, answer questions)
2. Tutorial explain = Produce some material that another student could use to teach
3. Self-explaining – think aloud / explain it to themselves

Then tested the tutors

Self-explaining better.

Interactions between students:

Compared **reflective ‘knowledge building’** (explaining, answering questions, making connections, understanding) v **didactic ‘knowledge telling.’**

most knowledge-telling instigated by tutor. Most knowledge-building instigated by tutee.

Quality of tutee question affected response. Shallow question → shallow response. Deep question → deep response (eg understanding, not just paraphrasing original text).

Learners and teachers can improve learning by asking better (deep) questions.

Finally

What might you do differently to help high achieving (or any other!) students?

Summary

High achievers may have natural ability and / or be hard workers. May have their own challenges.

Growth mindset improves learning and self-esteem and resilience.

Target students' zone of proximal development, and help 'scaffolding.'

Active learning is better than passive.

Stimulate students with: more challenging cases, 'what if' scenarios, transformational ideas, counter-examples.

Hard concepts include: empathy, uncertainty, doing nothing, breaking rules and challenging guidelines, complex or chaotic situations, and summarising.

Teaching others benefits the teacher, especially if 'reflective knowledge building'

Be honest when you don't know and learn together.

THANK YOU

We are the projects
that make headlines
And people that
make history

We are the original redbrick