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What Do We Know About and Can Learn from Students' Learning Trajectories?

https://twitter.com/LearningGains

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11-07-2017 Manchester, UK

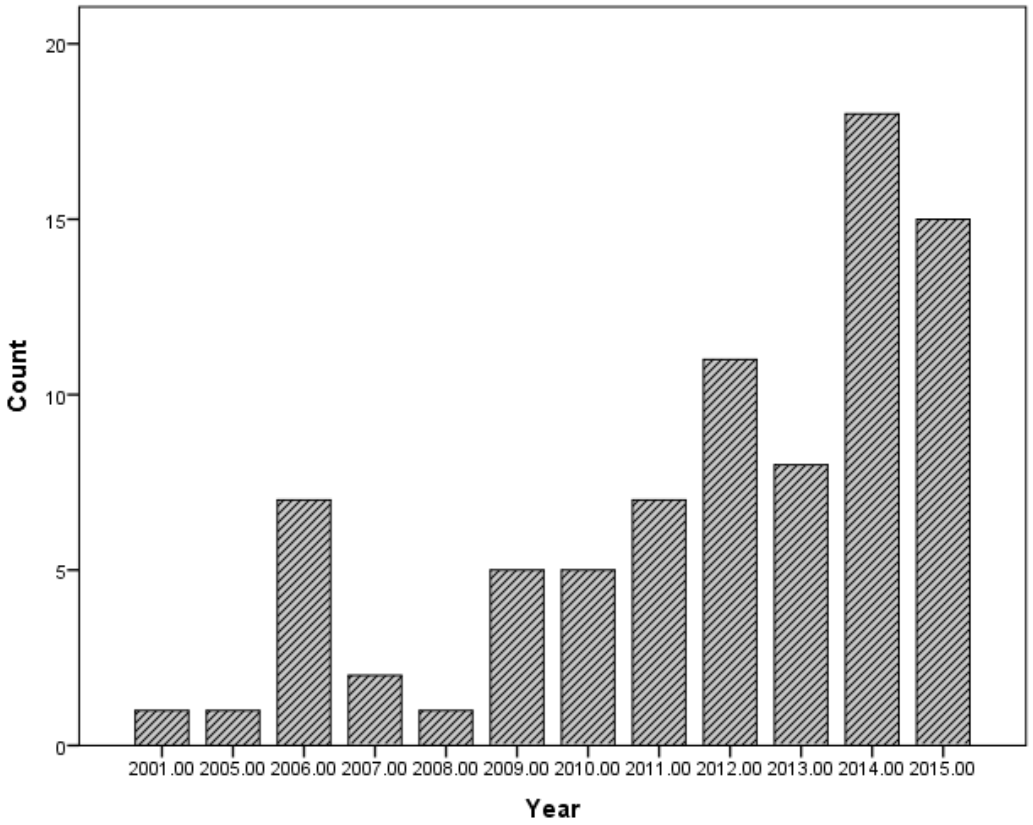
Learning Gains definition

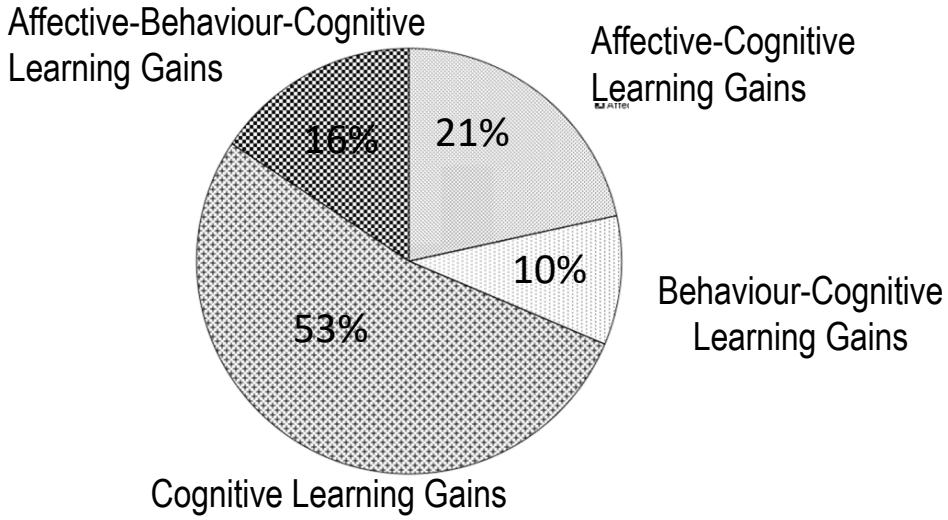
Growth or **change** in *knowledge*, *skills*, and *abilities* over time that can be linked to the desired learning outcomes or learning goals of the course

+ *personal development*

What does the literature say about Learning Gain?

- The concept of learning gain is primarily used to examine the effect of any particular educational 'intervention'

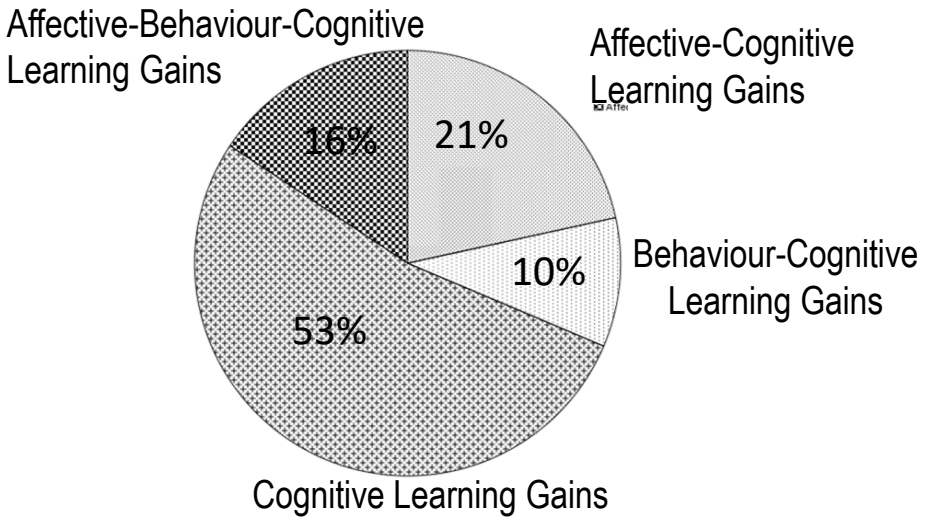




How learning gains are measured: a meta-analysis

80% used pre- post test design assessing learning gains through standardised and objective tests/inventories

20% used self-reported questionnaires or a combination of objective tests/inventories and self-reported questionnaires



	Affective	Behaviour	Cognitive
Pre-post objective	-	-	31 (21,836)
Pre-post subjective	9 (1,561)	1 (114)	6 (12,942)
Cross-sectional subjective	10 (1,772)	12 (4,154)	16 (5,082)

Rogaten, J., Rienties, B, Cross, S., Whitelock, D., Sharpe, R., Lygo-Baker, S., Littlejohn, A. (Submitted: 25-03-2017). Reviewing affective, behavioural, and cognitive learning gains in higher education.

What students think they gain?

I think I am more openly critical
(in the positive sense)

Day to day when I have my book I have very different approach from recording my notes for example

I am much better at time management, I am much more organised now and planning things in advance.

I observe things better, work into deeper and work on the whole picture rather than narrow.

[in my new job], there will reports and planning to be drawn and I think that this will be an aspect of my job where I can say yes the OU study and discipline I've received from the OU has actually contributed to that.

I think I can go confidently to speak what I learned. But even to a job that isn't directly related to this subject area. I could talk about my experiences, my time management, team working, computer skills as I feel much more confident, I can say, 'actually I have done this'. Which was one of the reasons I wanted to a degree.

I think more logically and more 'why did that happen, why did that happen', there is more questioning, instead of just to accept things.

I feel more confident and I am happier because I am doing something I have always wanted to be doing and something that interests me

now I say, 'you know what, I can do that in future'.

Why learning gains?

Do grades matter?

How well do your grades represent your progress?

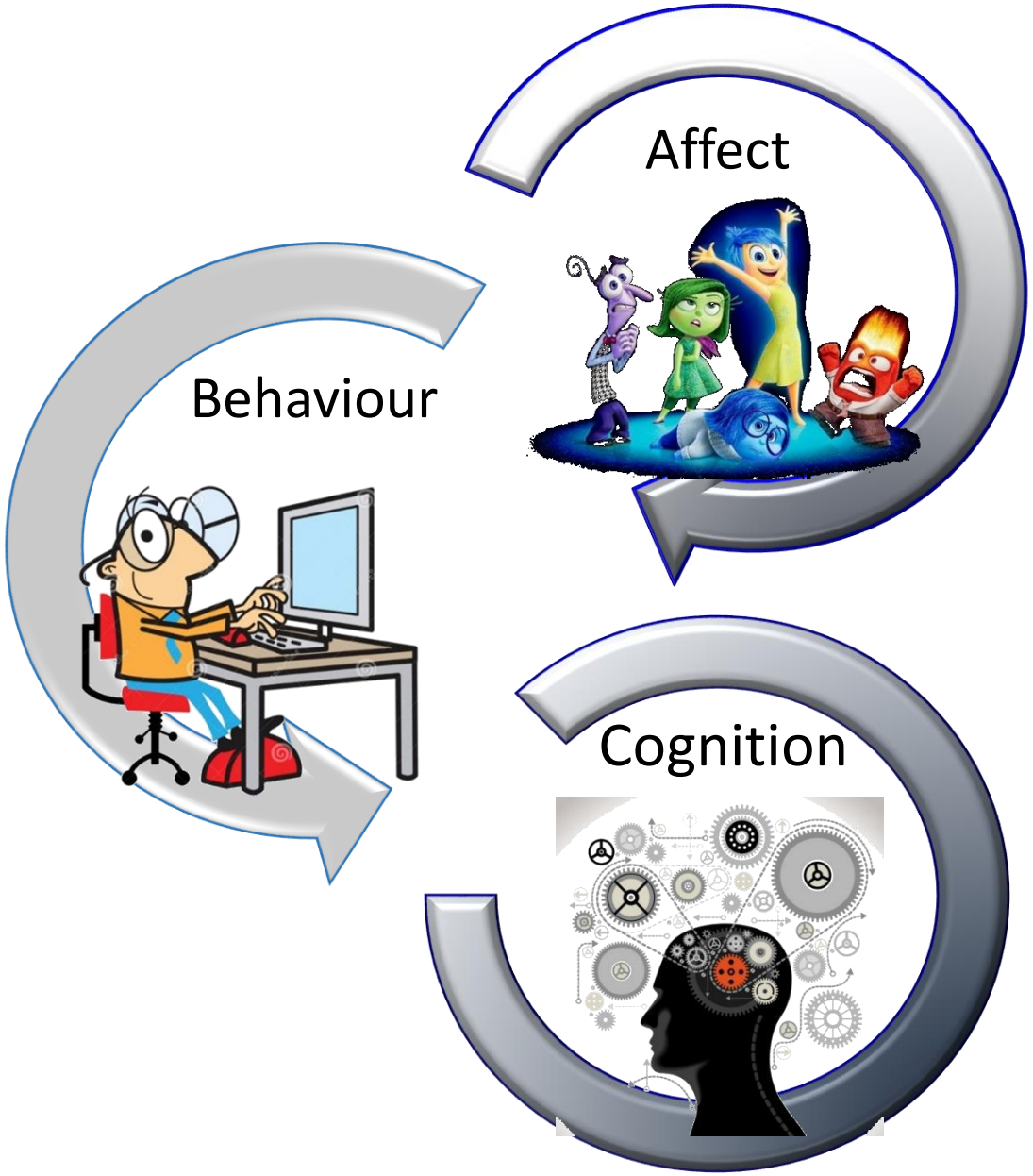
Well there are questions with the text books, exercises. So if I get correct answer, I know I am doing fine. When I say correct answer that's not the end product that's the whole answer check through it

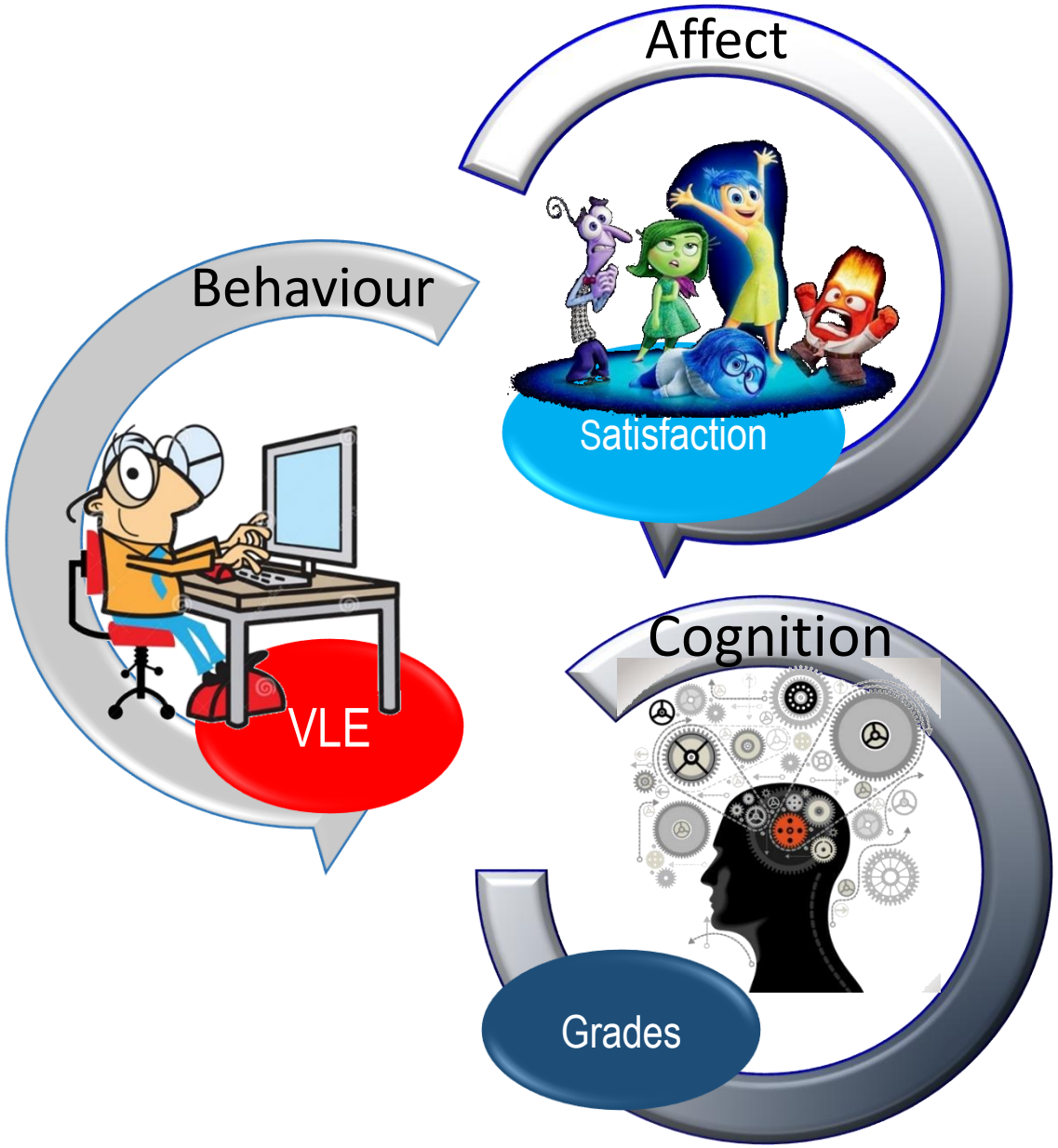
probably in the same way that many other people when they look at their own assignment results and exam results …. I feel that I am doing fairly well but I'd always like to improve myself to my results.

I get quite upset when I get around 70s

Even if it is 1-2 marks I say what did I do differently and I go back to tutor to see what did I do differently. What happened, what caused it?

… because I am putting so much effort I want my grades to reflect it. They usually go up. But it is Marginal. 5 marks across all the TMAs that's the variance, it just varies very slightly


Affect
Behaviour
Cognition

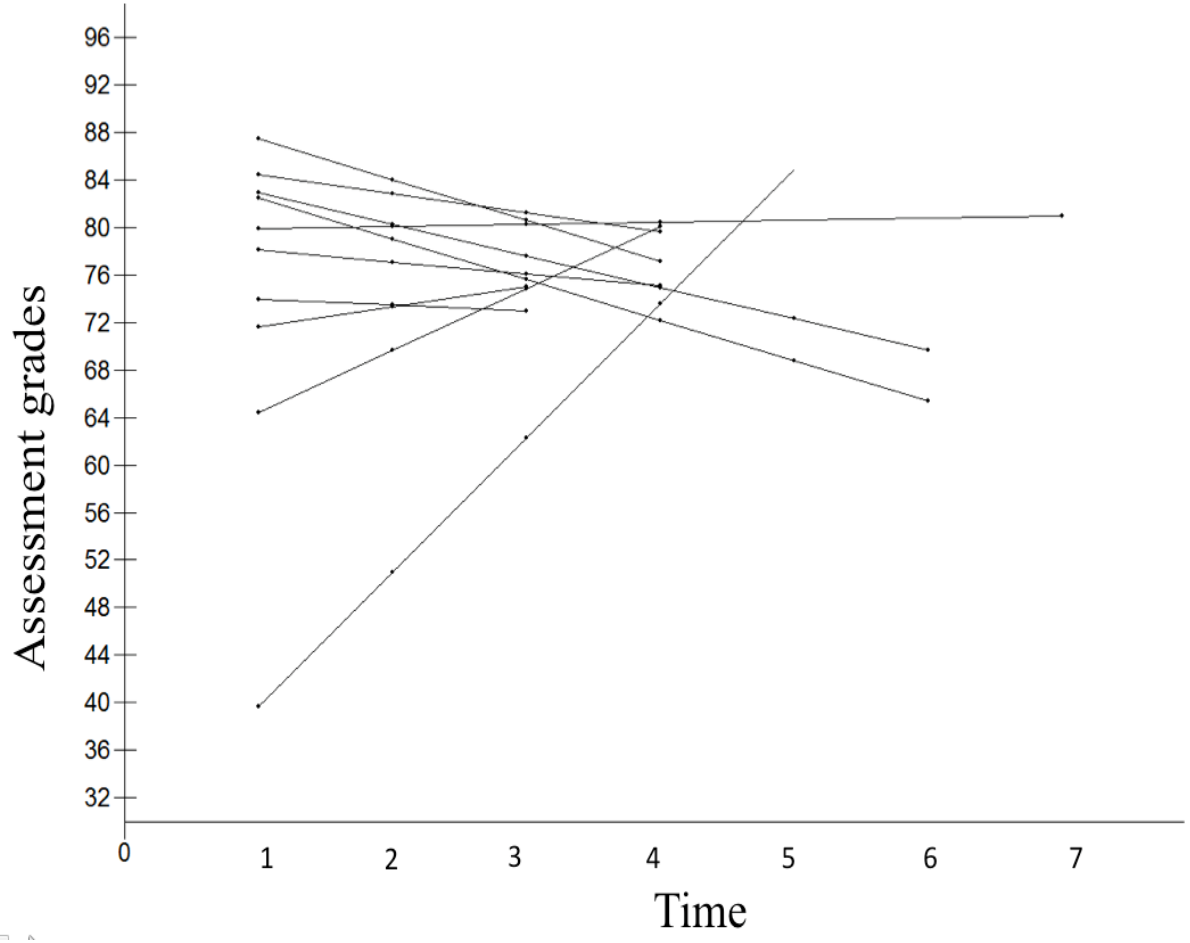

Affect
Satisfaction
Behaviour
VLE
Cognition
Grades

Do students make learning gains, and what is the power of LA to predict learning gains?

- Using assessment results for estimating learning gains has number of advantages:
  - Assessment data readily available
  - Widely recognized as appropriate measure of learning
  - Relatively free from self-reported biases
  - Allows a direct comparison of research finding with the results of other studies

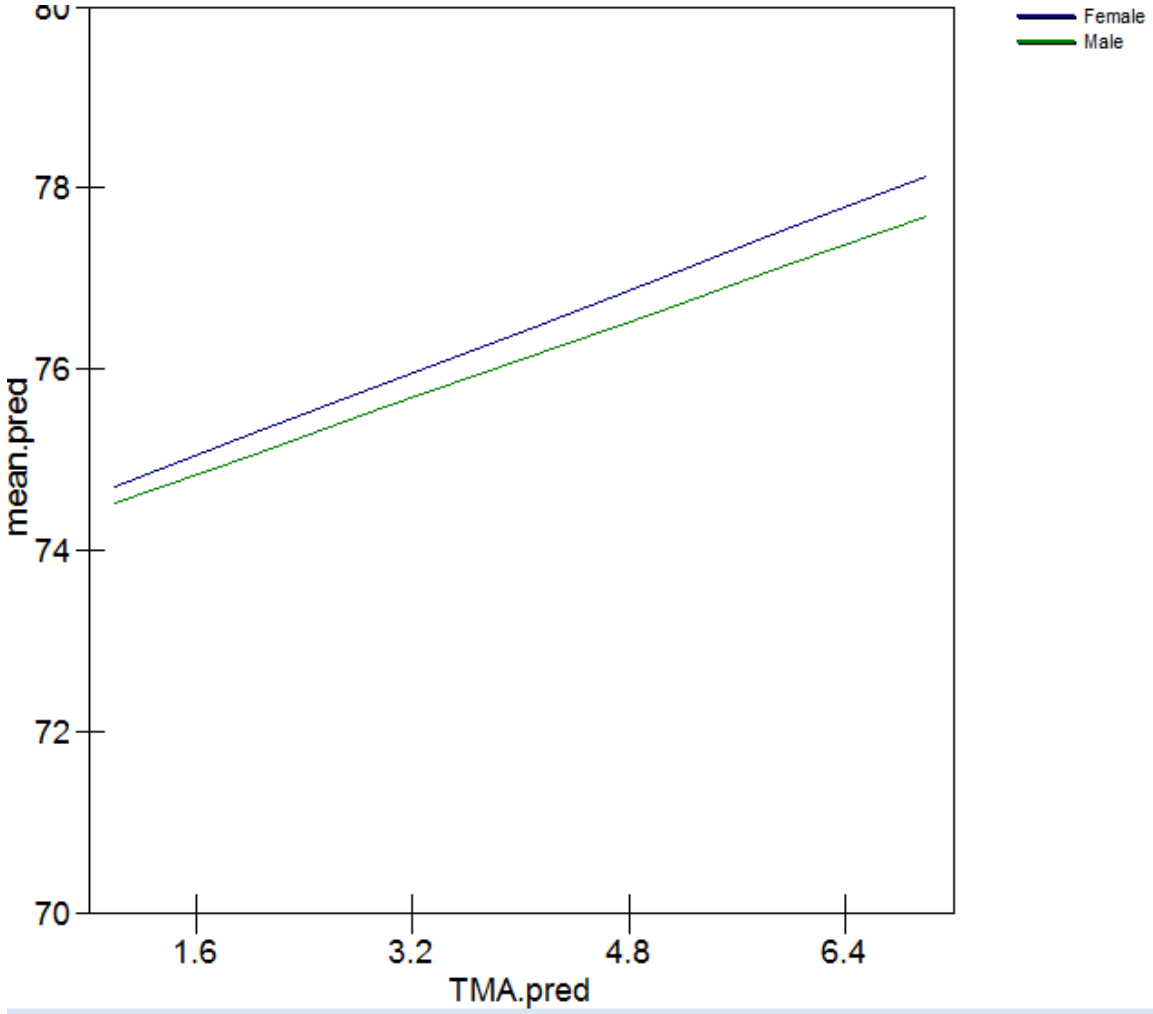
What have we learned about OU Students?

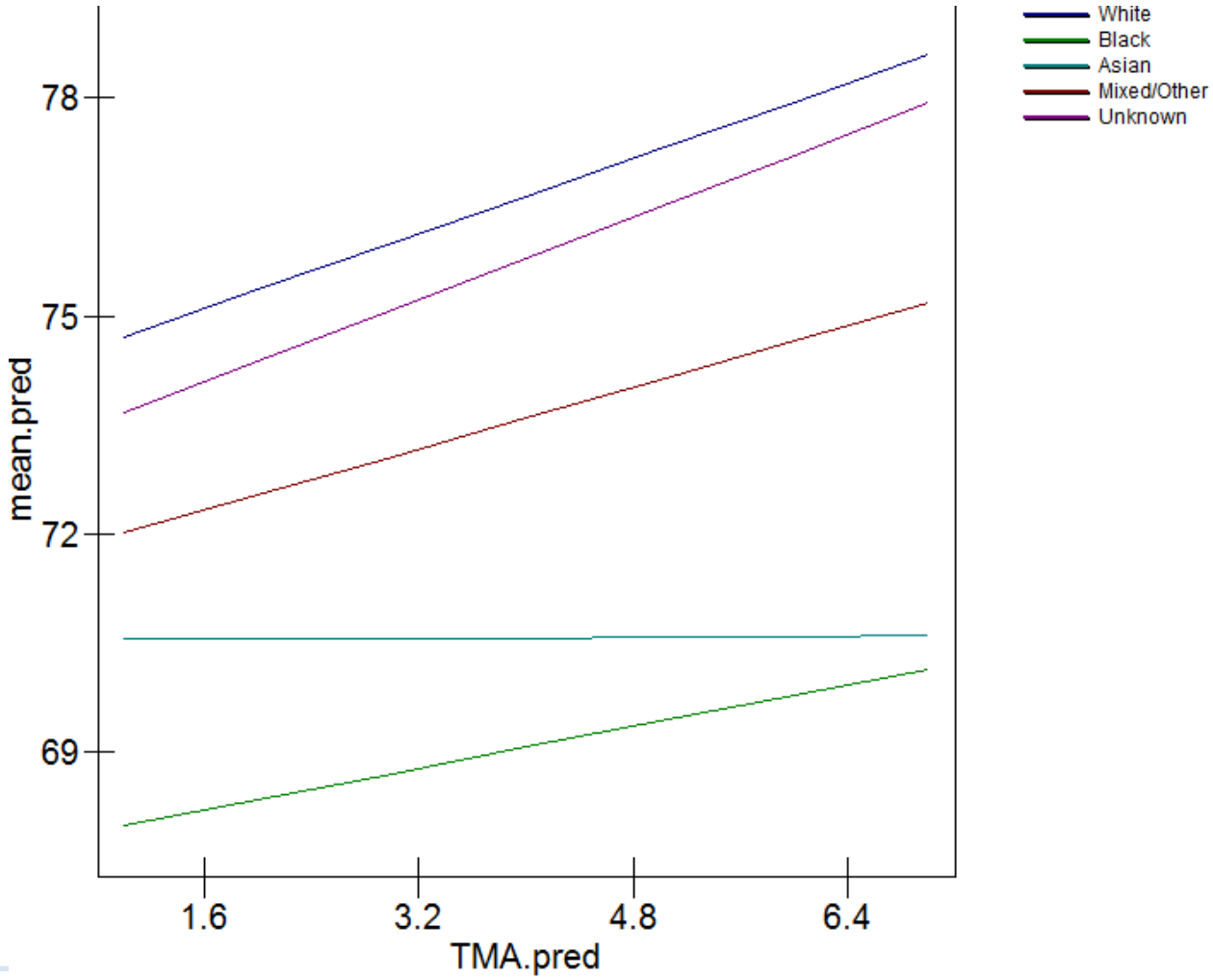
1st year STEM students



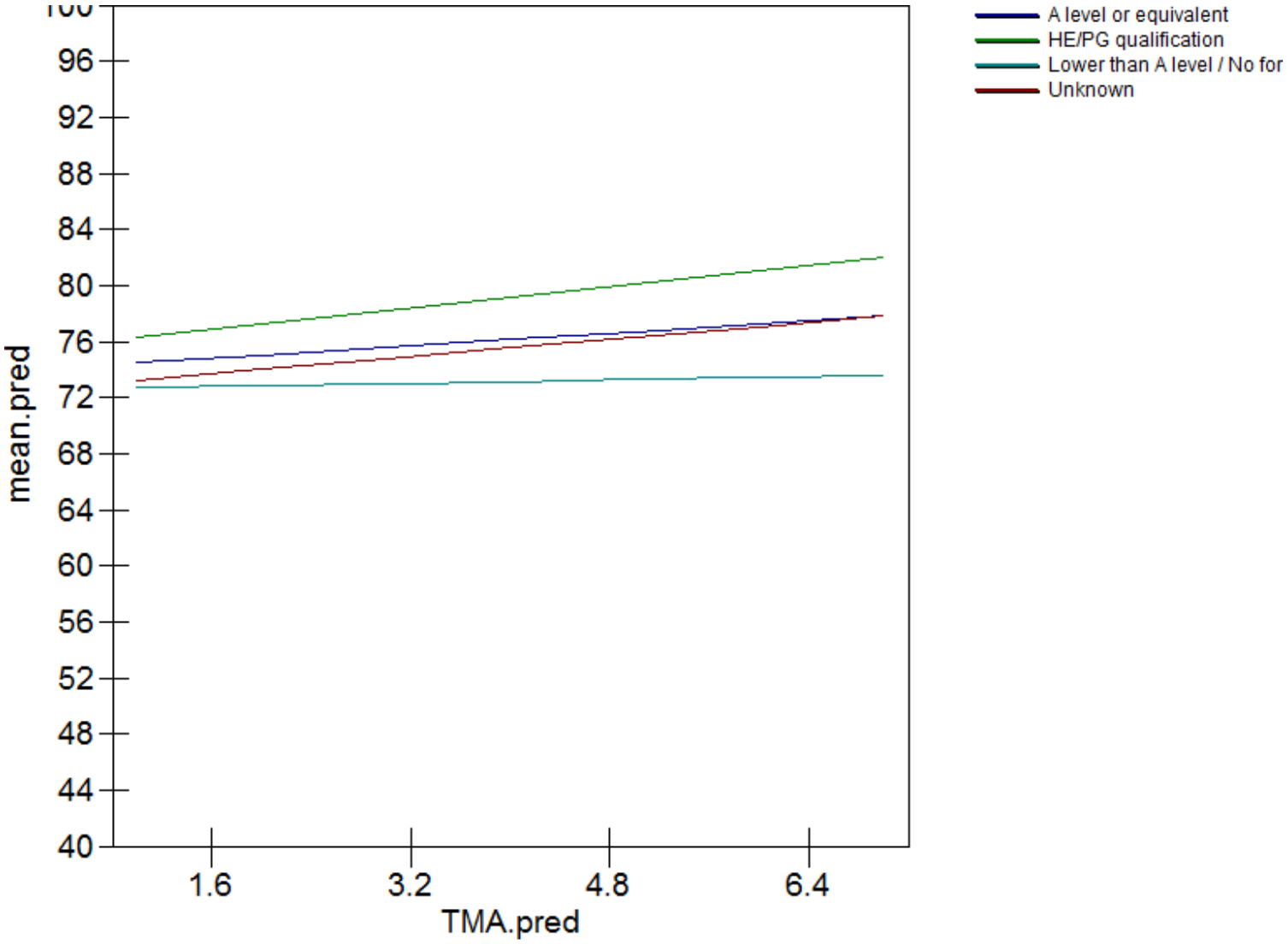
VPC course	51.6%
VPC student	9.1%
VPC TMA	40.3%

1st year STEM students





1st year STEM students



Trajectories differ in different disciplines

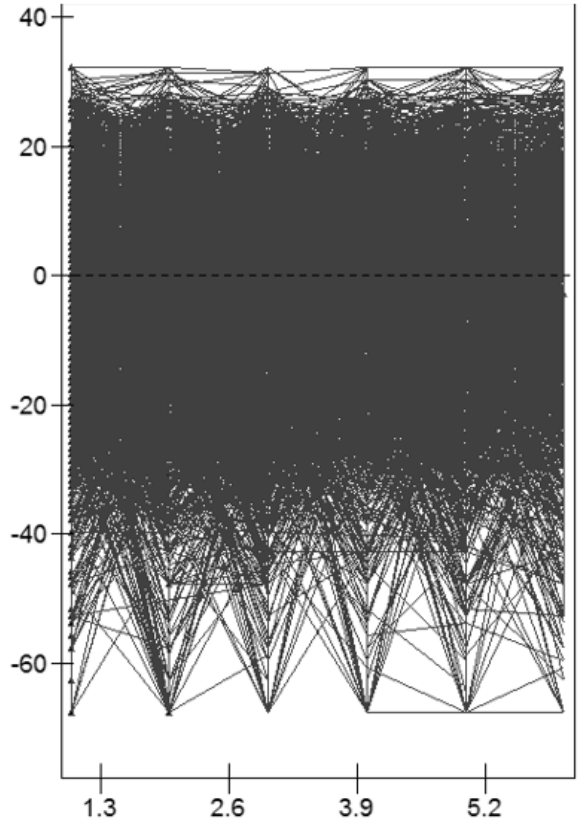
How do STEM students compare to Social Science students

- Participants
  - 5,791 Science students of whom 58.2% were females and 41.8% were males with average age of M = 29.8, SD = 9.6.
  - 11,909 Social Science students of whom 72% were females and 28% were males with average age of M = 30.6, SD = 9.9

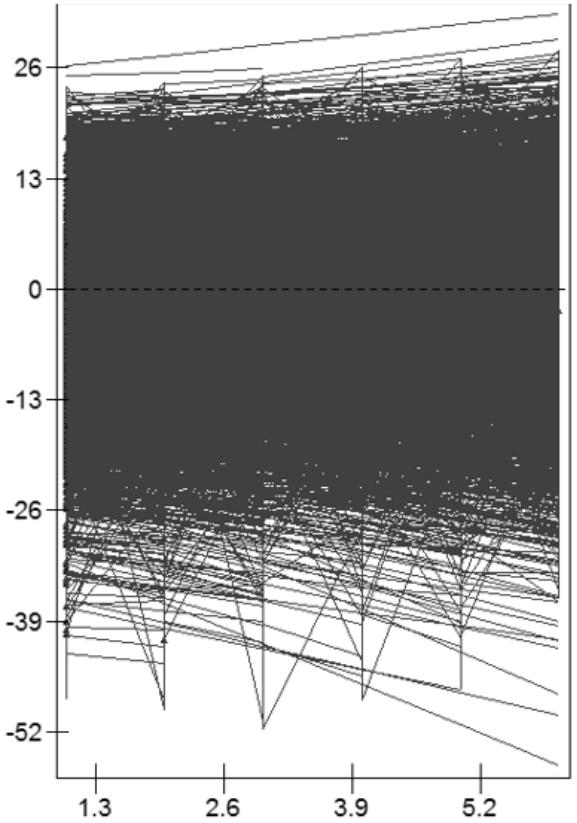
- Measures
  - Tutor Marked Assessments (TMA)
  - Across 111 modules

Descriptive statistics: Social Science

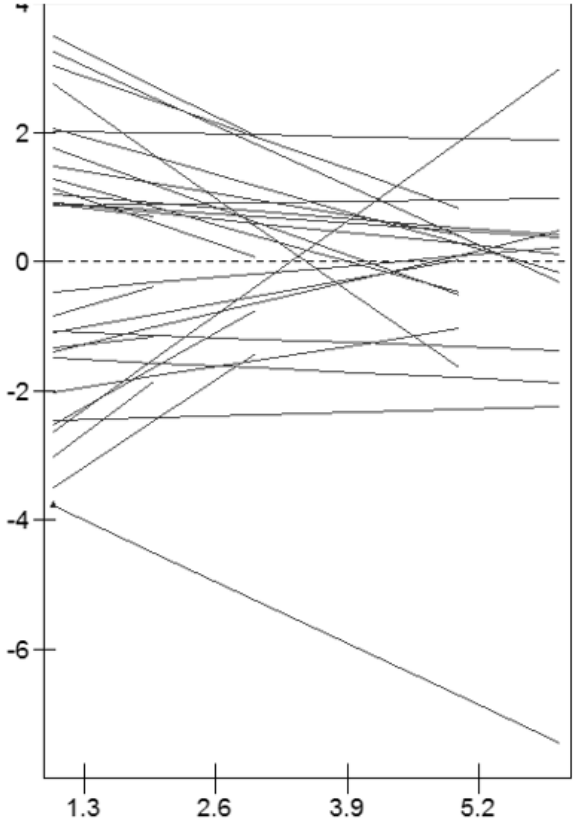
Trellis plot



Students' growth-curve

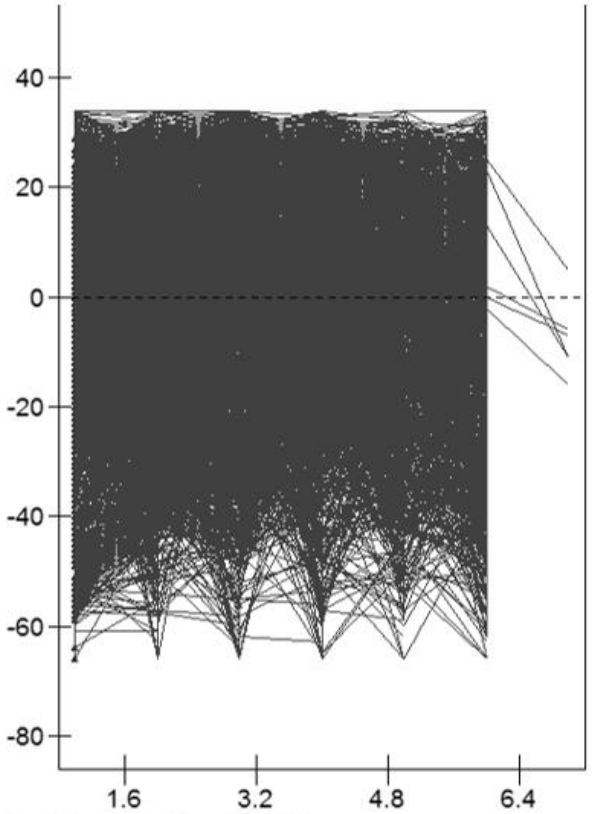


Modules' growth-curve

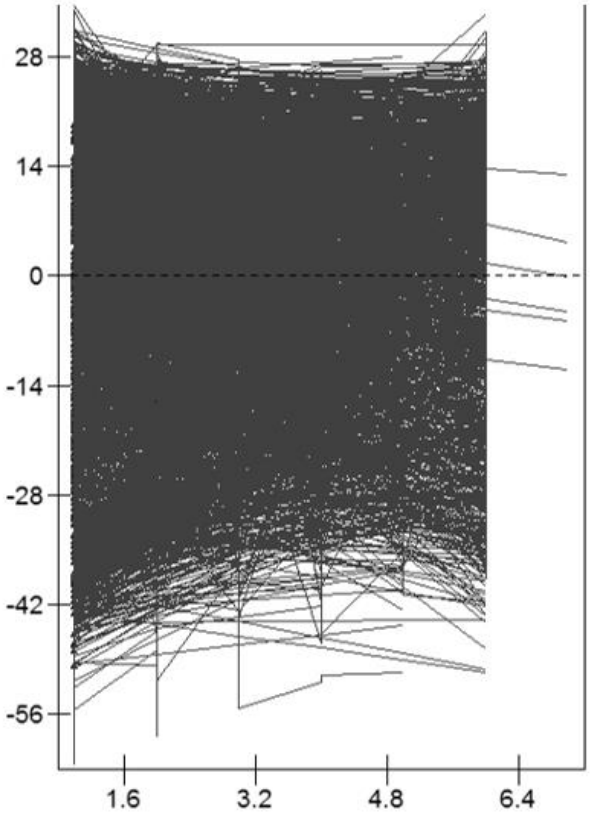


Descriptive statistics: Science

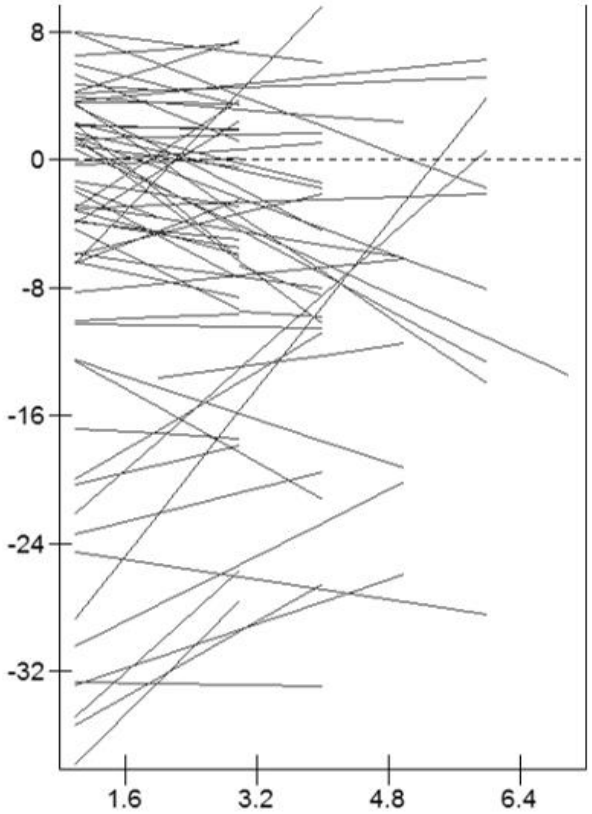
Trellis plot



Students' growth-curve



Modules' growth-curve



How do STEM students compare to Social Science students

	Social Science	*Science*
Variance in students' initial achievements	6%	33%
variance in students' learning gains	19%	26%
VPC module	4%	25%
VPC student	56%	51%
VPC TMAs	40%	22%

Benefits of knowing students' learning gains: We can make a positive change

Identify students and courses that progress well
Identify students and courses that do not progress well
Predict how certain students will do in certain courses

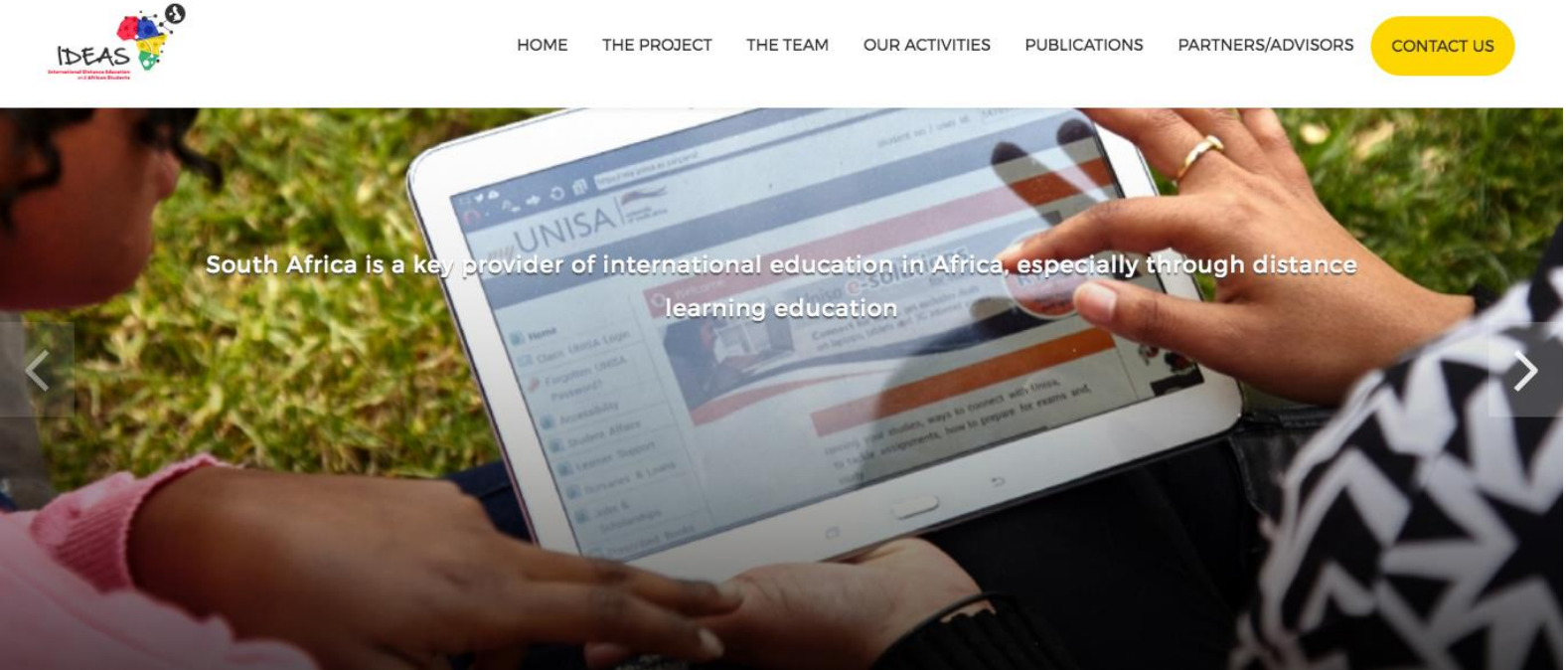
Implement data informed interventions
Evaluate effectiveness of interventions
Identify most effective routes towards qualification

IDEAS

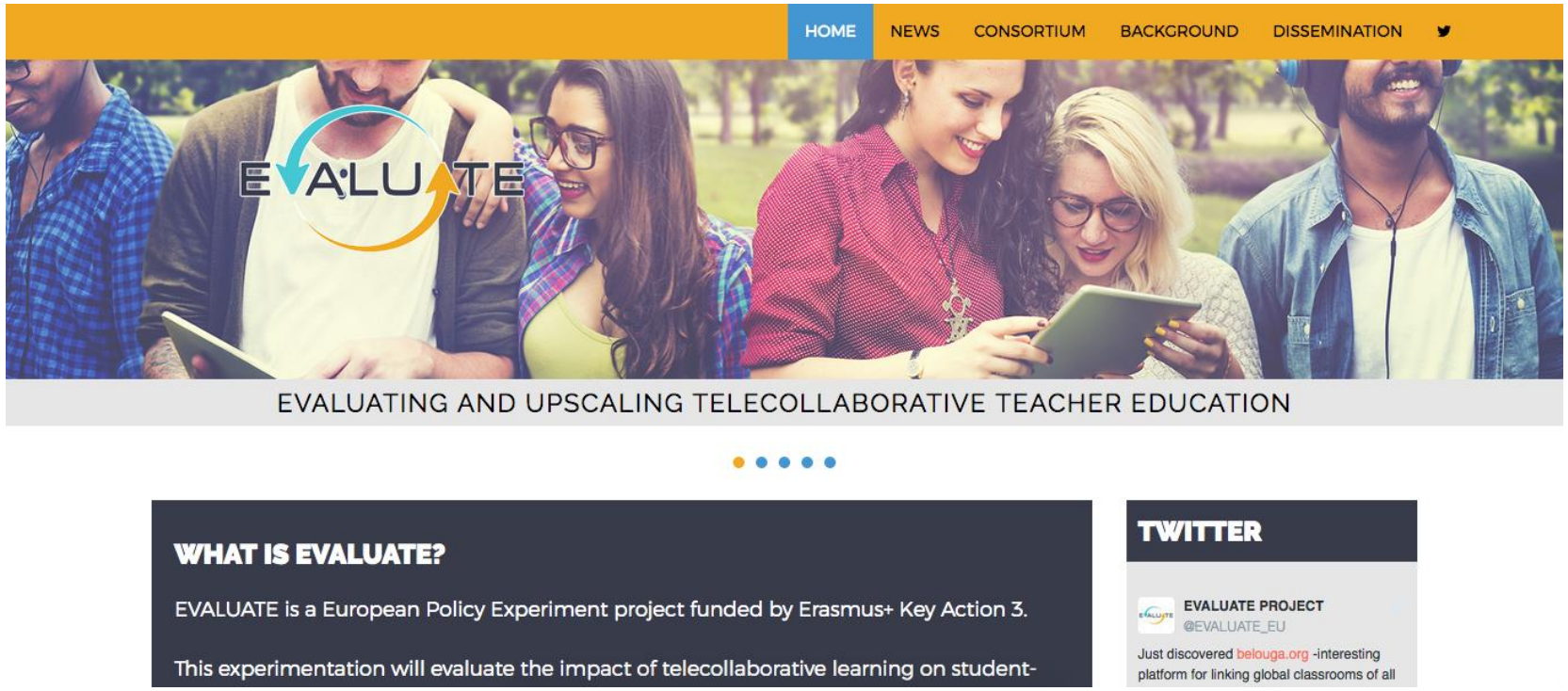
International Distance Education and African Students

Domestic and international students social and academic adaptation, and learning gains in distance HE in SA

http://ideaspartnership.org



https://www.evaluateproject.eu/



Is **telecollaboration** effective in developing future teachers' learning gains in:

1) Digital-pedagogical competence
2) Intercultural competence
3) Foreign language competence

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