

6th CSIR Conference

Skills and Innovation as a key driver for
Industrial Development in SA

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Where is SA education?

Our education system is still industrial age with a culture of testing & standardisation, leading to students becoming knowledge consumers rather than knowledge producers.



THE WORLD IS MOVING FORWARD

- We now live in a **knowledge economy** which requires a different skill set
- **21st Century employers** are looking for:

across
written CRITICAL oral
influence
THINKING
ADAPTABILITY
INFORMATION
Curiosity networks
SOLVING
AGILITY
ACCESSING
Collaboration
Imagination
Leading
Entrepreneurship
Communication
Initiative
ANALYZING
Effective
PROBLEM



AFRICA IS AN IMPORTANT GLOBAL PLAYER

- Whilst SA ranks 61st in the WEF Global Competitiveness Report, education is still a big concern
- We need an educational approach that makes us globally competitive whilst understanding & preparing children for our unique African context
- Our children are INDIVIDUALS – our approach to educating them must allow for individualised education pathways



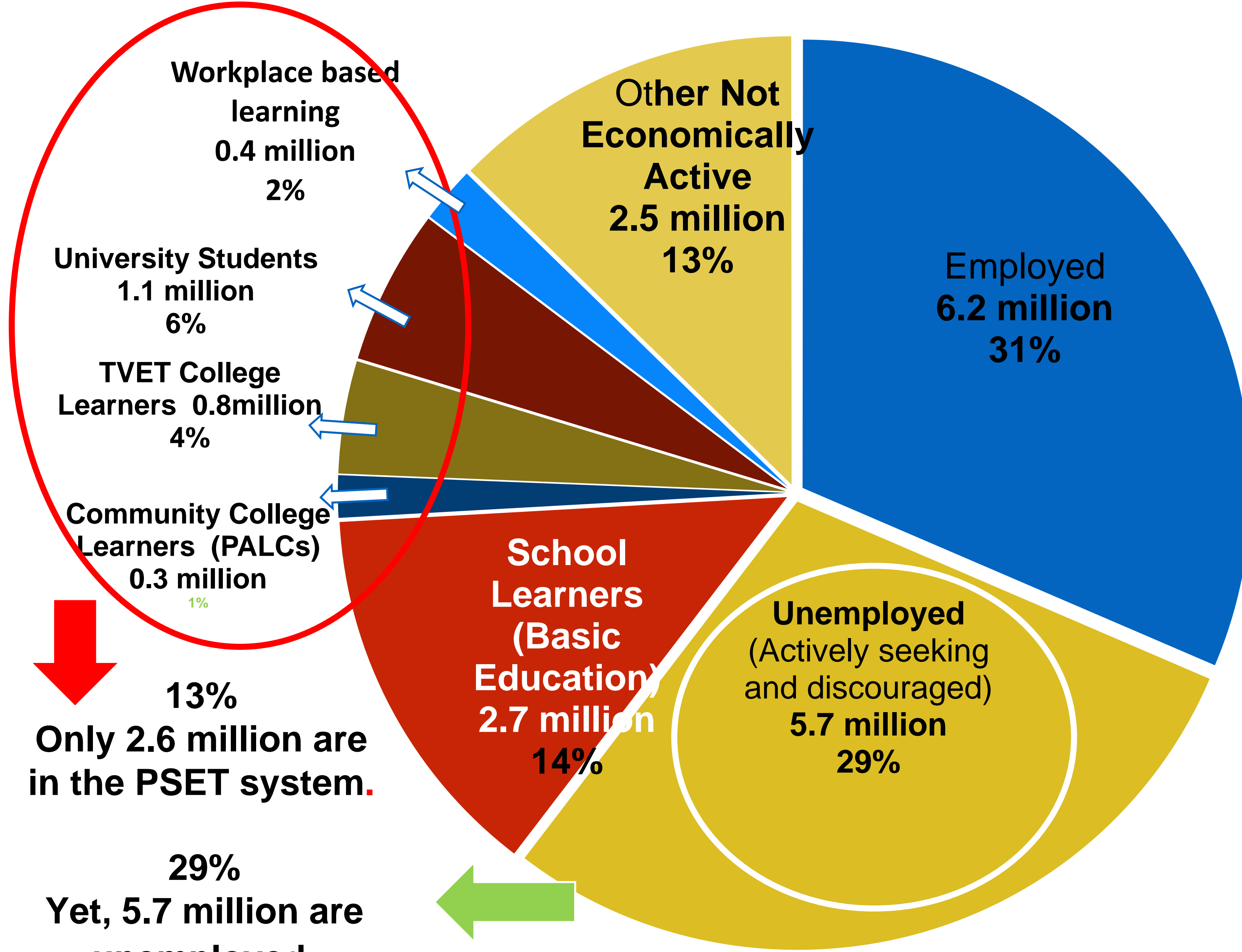
The country's future competitiveness in terms of research and innovation depends largely on a healthy Science, Engineering, Technology and the Arts human capital pipeline



SA's Science, Engineering and Technology enrolments at HEI's stagnant... Creative Arts undermined

over the past decade the percentage of SET enrolments at South African higher education institutions (HEIs) has been stagnant, rising only from 28.7% in 2005 to 29.9% in 2015.





13%
Only 2.6 million are in the PSET system.

29%
Yet, 5.7 million are unemployed.

19.7 million youth (ages 14 to 34 years)

Current education model needs rethink...

According to the World Economic Forum, 65% of the students in primary school today will be doing jobs that do not currently exist.



Current education model needs rethink

Our education system from ECD to higher education institutions which is still largely based on the architecture of the 19th and 20th centuries



Current education model needs rethink

Rethink all aspects
Curriculum, Teacher Training,
Assessment, Access,
Pedagogies, Subjects and
integration thereof.

Skills and content balance
rather than just a focus on
content.



Technology disruptions in education

- Global Classroom: interaction across the world
- Future Workplace focus: flexible and output driven, slashy generation with multiple talents, search for meaningful work
- Virtual and Augmented Reality: experiential learning that is immersive without relying on expensive resources (eg: labs)
- Artificial Intelligence & Big Data: machine learning for truly personalized learning and mastery



Current education model needs rethink

According to the World Economic Forum, 65% of the students in primary school today will be doing jobs that do not currently exist.



High Paying Jobs that did not exist 10 years ago

- Data analytics director
- User experience executive
- Head of sustainability
- Mobile APP developer
- Web analyst
- Wearable tech engineer



Building character and human skills become critical

1. Ability to deal with uncertainty-more grit and a positive mindset to navigate change.
2. Cognitive abilities.
3. Problem solving skills
4. Ability to understand and deal with complex systems
5. Ability to assimilate important and useful information from a lot of noise



Current education model needs rethink

Education must increase its focus on developing ethical leaders of government, business and our society



CREATING AN INNOVATION CULTURE

- Role of the individual to make a better world
- Individuals rise to the occasion and face risks in search for a better world
 - Nurture problem solving
- managed innovation platform to enable collaboration and connection



Three qualities allow for an innovative country

- empowerment;
- problem solving skills and
- diversity.



Driving a culture of innovation

- a higher level of **informality** that allows for flexibility is important
- Countries that thrive in innovation are countries that have a **high percentage of immigrants**, such as Israel and the USA
 - **risk taking environment**
 - **the ability to tolerate failure**
- We need to ask whether the country has **the spirit of questioning**



We need to increase our R&D expenditure

There has been a decrease in South African R&D expenditure as a share of the world's R&D expenditure, from 0.42% in 2006/07 to 0.28% in 2013/14



Conclusion

Improving the quality of our education system and driving innovation through increased R&D and partnerships between the public sector, HEIs and the private sector has become critical and urgent



THANK YOU

