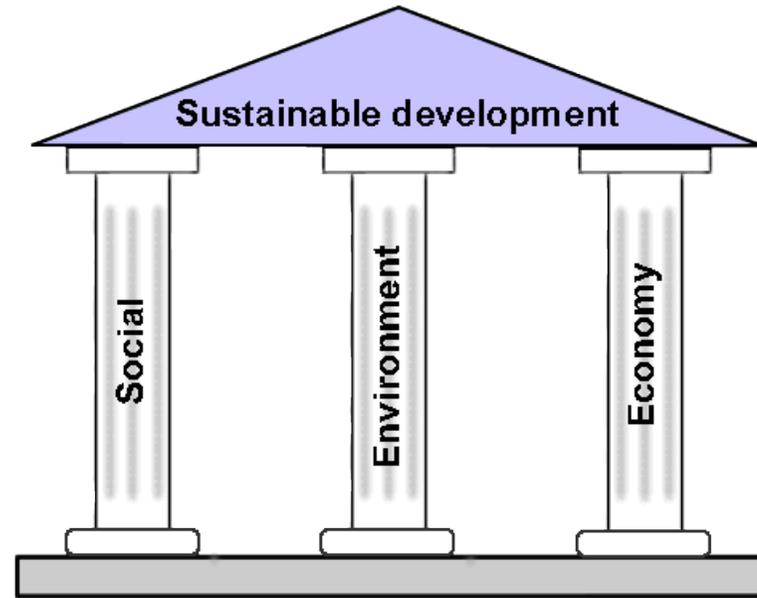




**for**  
**Sustainable Development**  
**(#VIP4SD)**

# Sustainable Development



**Global and holistic approach to economic development** that not only focuses on **economic** growth and ending extreme poverty, but also combines this with **social** fairness and justice and **environmental** sustainability.

1972



1987



1992



2000



2012



2015



# SUSTAINABLE DEVELOPMENT GOALS



The **SDGs** are part of Resolution 70/1 of the United Nations General Assembly: "Transforming our World: the **2030 Agenda** for Sustainable Development".

**SDGs** provide the framework and guiding principle for Sustainable Development and ESD



“Target 4.7:  
By 2030, ensure that **all learners** acquire knowledge and skills needed to promote sustainable development, including, among others, through **Education for Sustainable Development**”

In 2025 the global student population in Further and Higher Education will reach more than **260 million**

- (Goddard, 2011)



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How can we best partner with our students now and in the future to leverage this potential to its full in the pursuit of the SDGs?



What innovative methods exist for embedding **Education for Sustainable Development** in undergraduate curricula that satisfy the demands of our students and go beyond raising their awareness, but offer a platform on which they can make tangible contributions to Agenda 2030 NOW?



What innovative methods exist for embedding **Education for Sustainable Development (ESD)** in undergraduate curricula?

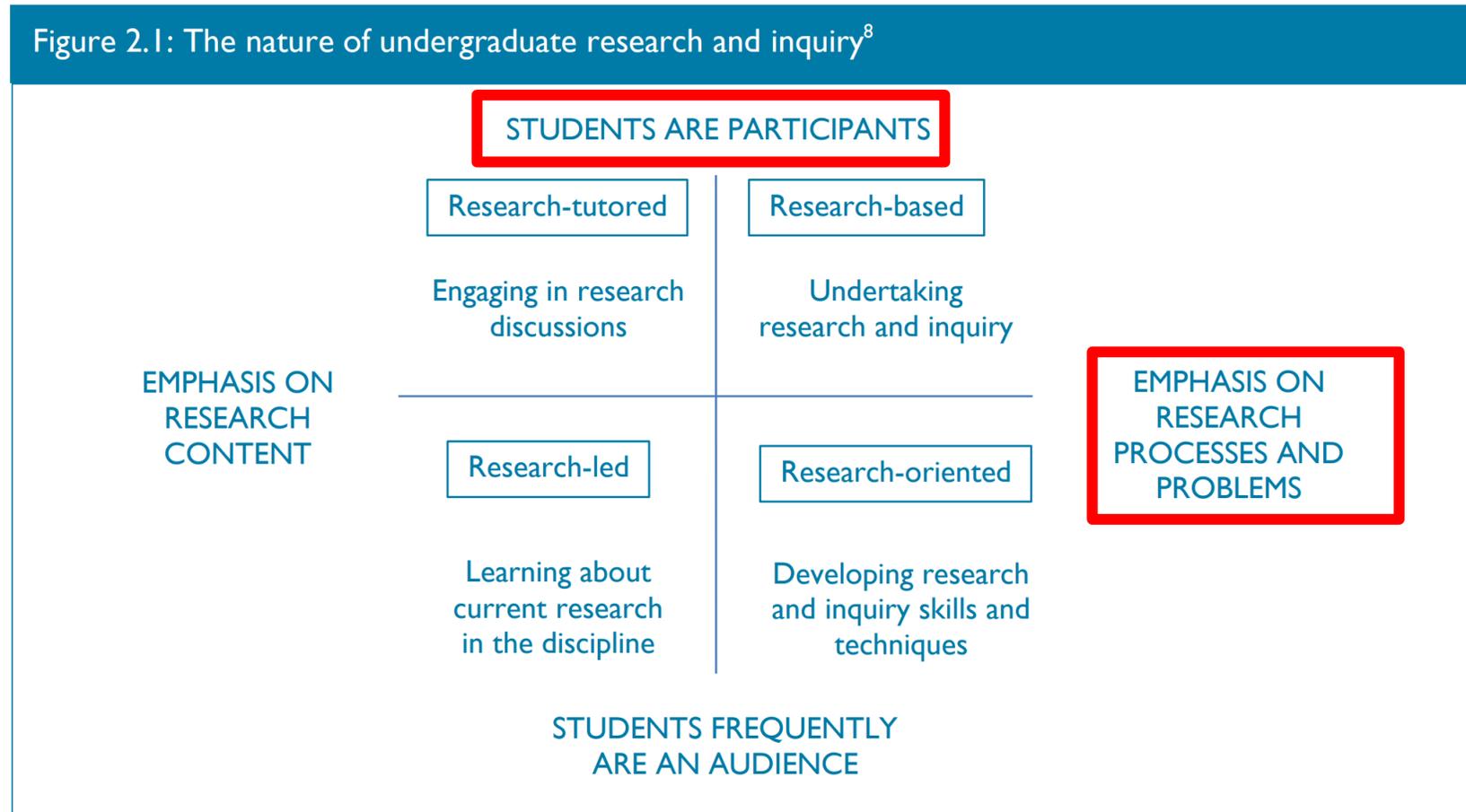
**Research-Based Education (RBE)**

**“... learning for sustainability”**

# Relationships between Research and Teaching



# Relationships between Research and Teaching



(Healey, 2009)

# Research-Based Education (RBE)

**Research-Based Education**, where  
students become research active,  
undertaking research and inquiry  
- (Griffiths, 2007)

Students are encouraged to become  
**'knowledge producers'** as opposed  
to **'consumers'** in tackling **real-  
world problems**  
- (Healey and Jenkins, 2009)

# Research and Teaching Nexus... VIP4SD

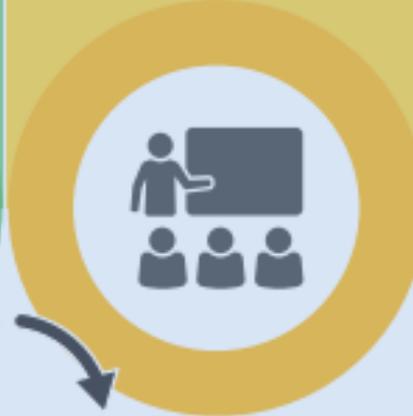


Research on the SDGs  
Interdisciplinary and transdisciplinary research  
Innovations and solutions  
National & local implementation  
Capacity building for research

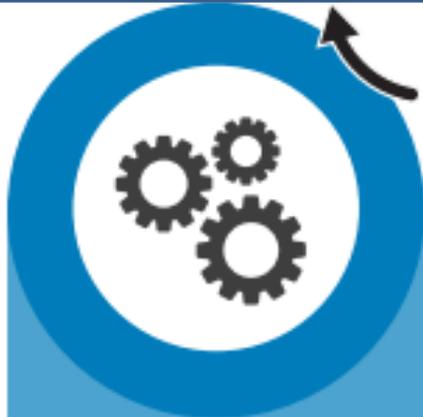
RESEARCH



EDUCATION

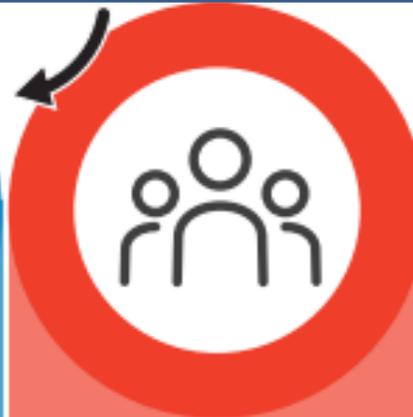


Education for sustainable development  
Jobs for implementing the SDGs  
Capacity building  
Mobilising young people



OPERATIONS & GOVERNANCE

Governance and operations aligned with SDGs  
Incorporate into university reporting



EXTERNAL LEADERSHIP

Public engagement  
Cross-sectoral dialogue and action  
Policy development and advocacy  
Advocacy for sector role  
Demonstrate sector commitment



# Research-Based Education (RBE)



Interdisciplinary working

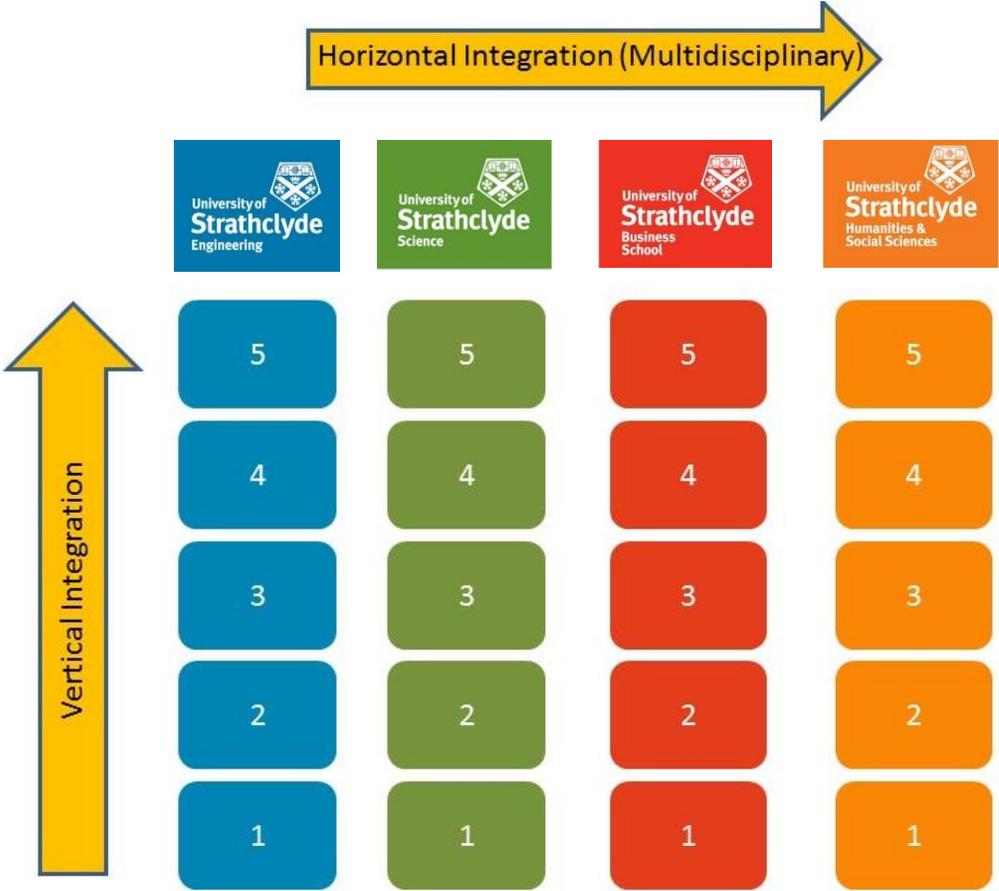
# Research-Based Education (RBE)

Horizontal Integration (Multidisciplinary)



Interdisciplinary working and learning between students of different year groups and research staff on 'real' research projects with pathways to impact

# Research-Based Education (RBE)



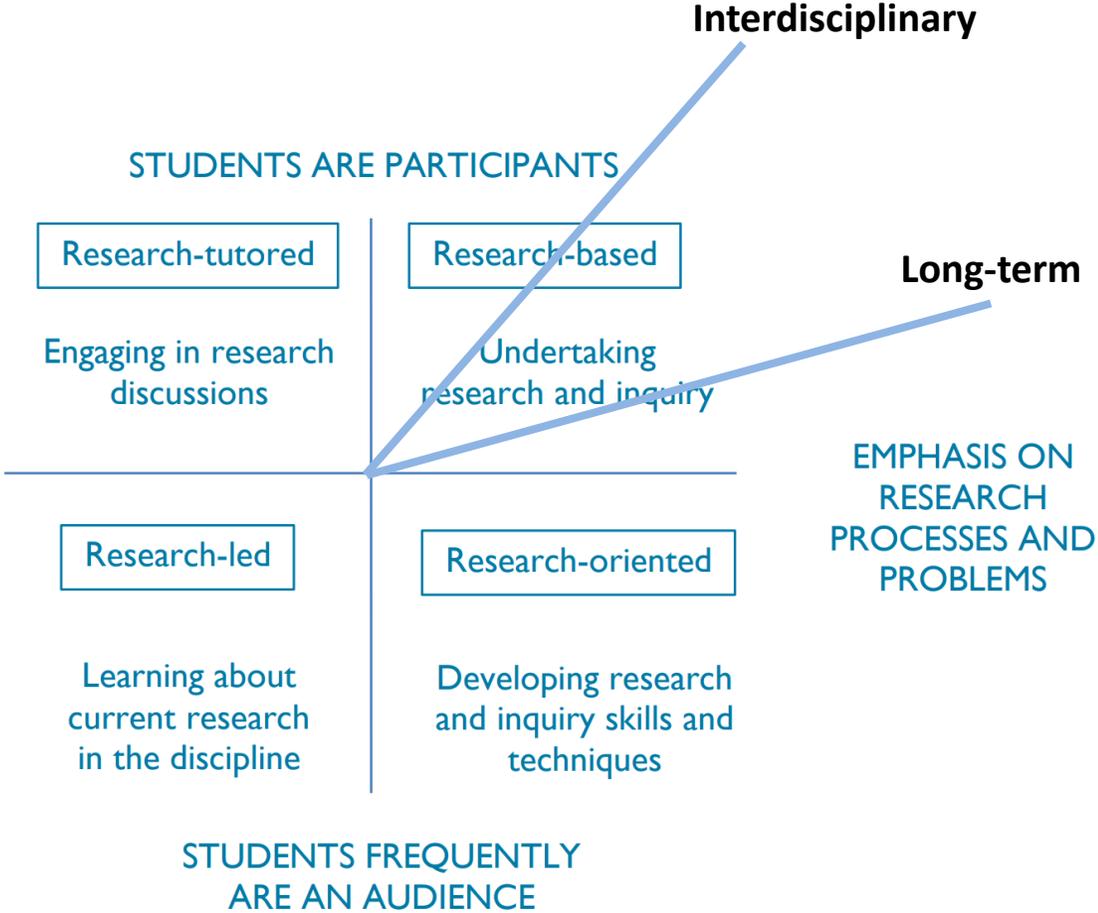
Collaborative working and learning between students of different year groups and research staff on 'real' research projects with pathways to impact

# Research-Based Education (RBE)

- added dimensions



EMPHASIS ON RESEARCH CONTENT



# VIP Research Vertically Integrated (RBE) Projects



Horizontal Integration (Multidisciplinary)

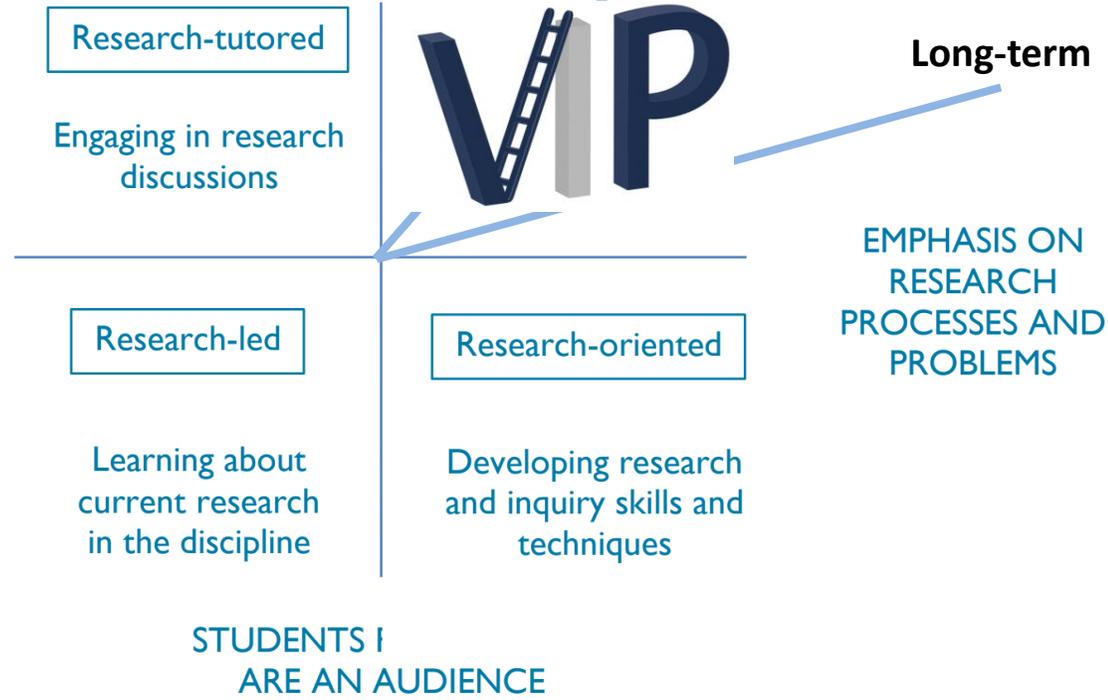
Vertical Integration

	University of Strathclyde Engineering	University of Strathclyde Science	University of Strathclyde Business School	University of Strathclyde Humanities & Social Sciences
5	5	5	5	5
4	4	4	4	4
3	3	3	3	3
2	2	2	2	2
1	1	1	1	1

EMPHASIS ON RESEARCH CONTENT

## Research-Based Education (RBE)

STUDENTS ARE PARTICIPANTS



STUDENTS ARE AN AUDIENCE

# VIP Vertically Integrated Projects

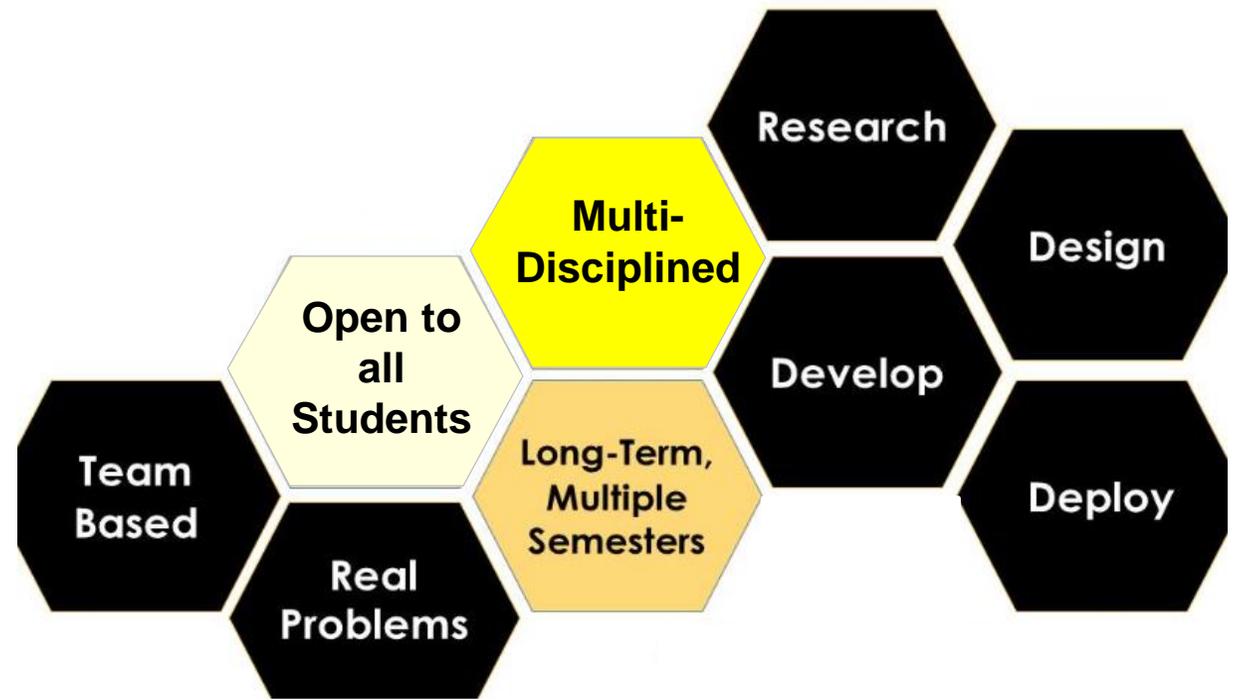


Horizontal Integration (Multidisciplinary)

Vertical Integration



## VIP Research-Based Education (RBE)





# for Sustainable Development

Horizontal Integration (Multidisciplinary) →

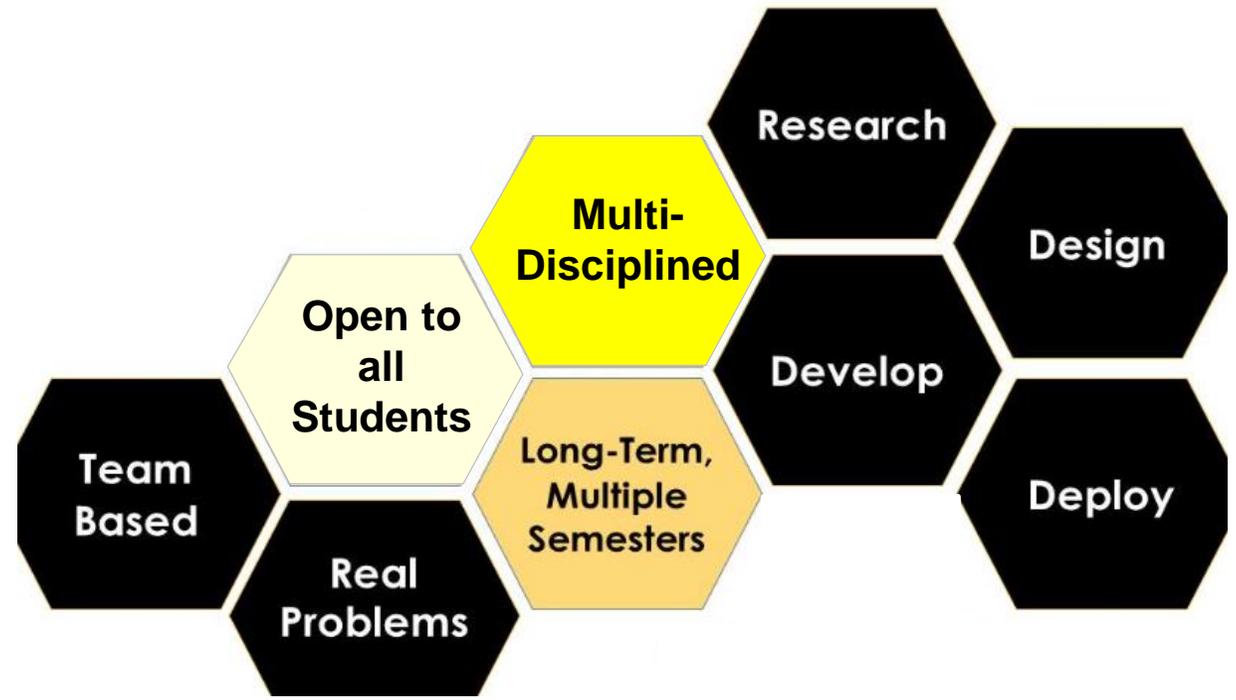


VIP4SD Intro/Platform

New 20 credit on-line subject-based SDG module



## Research-Based Education (RBE)





**1101 Students**  
**80 VIP Projects**



Prof Ed Coyle

# The **VIP** Consortium: 35 Members So Far....



## **United States (24)**

- Arizona State University
- Boise State University
- Colorado State University
- Drexel University
- Florida International University **URM**
- **Georgia Tech** **AAU**,1
- Howard University **URM**
- Iowa State University **AAU**
- **Morehouse College** **URM**,1
- New York University **AAU**
- Notre Dame
- Polytechnic Univ of Puerto Rico **URM**
- Purdue University **AAU**,1
- Rice University **AAU**
- Stony Brook University **AAU**
- Texas A&M University **AAU**,**URM**, 1
- UC Davis **AAU**,**URM**
- University of Delaware

- **University of Georgia**
- University of Hawaii **URM**
- University of Michigan **AAU**, 1
- University of Washington **AAU**
- VA Commonwealth University
- Virginia Tech

## **International (11)**

- Inha University (Korea)
- Malmö University (Sweden)
- Natn'l Dong Hwa University (Taiwan)
- Natn'l Ilan University (Taiwan)
- Riga Technical University (Latvia)
- Universidad del Norte (Colombia)
- Universidad ICESI (Colombia)
- Universidad Mayor (Chile)
- Univ. of New South Wales (Australia)
- University of Pretoria (South Africa)
- University of Strathclyde <sup>1</sup> (Scotland)

## **Pending (5)**

- **Georgia State University**
- NCA&T University **URM**
- Reykjavik University
- Tuskegee University **URM**
- UNICAMP
- Universidad de Chile

## LEGEND:

**AAU:** Member Institution (9)

**URM:** Underrepresented  
Minority Institution (7)

1: Program in place prior to  
Consortium establishment (5)

**Bold: State of Georgia  
Institutions (3)**

# 2019 VIP Consortium Meeting in Atlanta





# for Sustainable Development

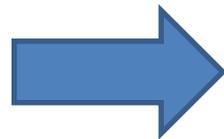
- **Research-Based** Education for Sustainable Development



provides the means  
for embedding

**R B E S I D E S D** in UG curricula

Means



End

# Existing VIP4SD Teams – ~ 150 students



University of Strathclyde Glasgow

Home Study with us Work with us Why Strathclyde

## Vertically Integrated Projects (VIP)

Information for Students

Are you interested in applying what you've learnt in the classroom to original research and development projects? Would you like to be a part of a multi-disciplinary team working with undergraduate and postgraduate students from all years and staff from across the University? Do you want to learn new knowledge and skills that will make you stand out from the crowd? If so VIP@Strath would like to hear from you! University of Strathclyde is running a programme of classes called Vertically Integrated Projects – VIP@Strath. These projects give students from first year through to postgraduate level the opportunity to work with staff in multi-disciplinary teams on cutting-edge research and development projects.

By taking part in a VIP project you will be able to:

- Learn and practice many different professional skills
- Make substantial technical contributions to a project
- Experience many different roles on a large design team
- Interact and receive support from more senior students and, in some instances, receive mentoring from PhD students involved in the project.
- Contribute to the completion of large-scale design projects that are of significant benefit to the research programmes of staff members.

If you would like to join the VIP Team please contact the relevant academic lead.

This year's projects include:

 Enterprise VIP	 Water and Sanitation	 Drug Discovery
 TextLab Stem Education & Public	 TextLab	 Water and Sanitation
 Water and Sanitation Sustainable Energy for Development	 Enterprise VIP	 ROVER

Strathclyde Analytical

### VIP Projects

@STRATH

[Enterprise VIP](#)  
[ROVER](#)  
[Drug Discovery](#)  
[STEM Education & Public Engagement](#)  
[Sustainable Energy for Development](#)  
[Systems Biology Of Polarized Growth](#)  
[TextLab](#)  
[Water and Sanitation Hygiene \(WASH\)](#)

### Sustainable Development Goals

Read about SDG's on the [UN Sustainable Development Goals website](#)

More about each goal

- [Goal 1: No Poverty](#)
- [Goal 2: Zero Hunger](#)
- [Goal 3: Good Health and Well-Being](#)
- [Goal 4: Quality Education](#)
- [Goal 5: Gender Equality](#)
- [Goal 6: Clean Water and Sanitation](#)
- [Goal 7: Affordable and Clean Energy](#)
- [Goal 8: Decent Work and Economic Growth](#)
- [Goal 9: Industry, Innovation and Infrastructure](#)
- [Goal 10: Reduced Inequalities](#)
- [Goal 11: Sustainable Cities and Communities](#)
- [Goal 12: Responsible Consumption and Production](#)
- [Goal 13: Climate Action](#)
- [Goal 14: Life Below Water](#)
- [Goal 15: Life on Land](#)
- [Goal 16: Peace, Justice and Strong Institutions](#)

- Enterprise VIP
- ROVER
- STEM Education & Public Engagement
- **Sustainable Energy for Development**
- Drug Discovery
- TextLab
- Water and Sanitation Hygiene (WASH)

# SUSTAINABLE DEVELOPMENT GOAL 7

Ensure access to affordable, reliable, sustainable and modern energy for all



“Energy is the **golden thread** that connects economic growth, increased social equity, and an environment that allows the world to thrive.”

– Former UN Secretary-General Ban Ki-moon





# Sustainable Energy for Development (SE4D)



## SE4D



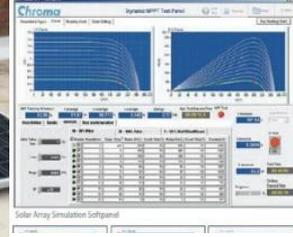
# SUSTAINABLE DEVELOPMENT GOAL 7

Ensure access to affordable, reliable, sustainable and modern energy for all



Global problem in need of effective  
and innovative engineering  
solutions...





# SE4D





# The Gambia Project

## Vertically Integrated Projects

While the Gambia Project has been responsible for 8 solar PV projects over the last decade, in 2012 the project started connecting students to work on real world problems through the Vertically Integrated Projects programme, or VIP.

VIP has linked several different academic disciplines together as a team: Electrical Engineering, Computer Science,

Design Manufacturing Engineering, and Business and Economics.

The VIP programme provides an opportunity for students to work over two academic years on a single project. By the second year they are mentoring the younger students and innovating technological solutions for places like the Gambia.



# Bold, Ambitious, Innovative and Collaborative

HEADMASTERS OFFICE

Notice / avis / avis / avis

PhD

EME

DMEM

SBS

CES

SBS

PhD



# Sustainable Energy for Development VIP

SE4D



**Student Experience**



**Research**

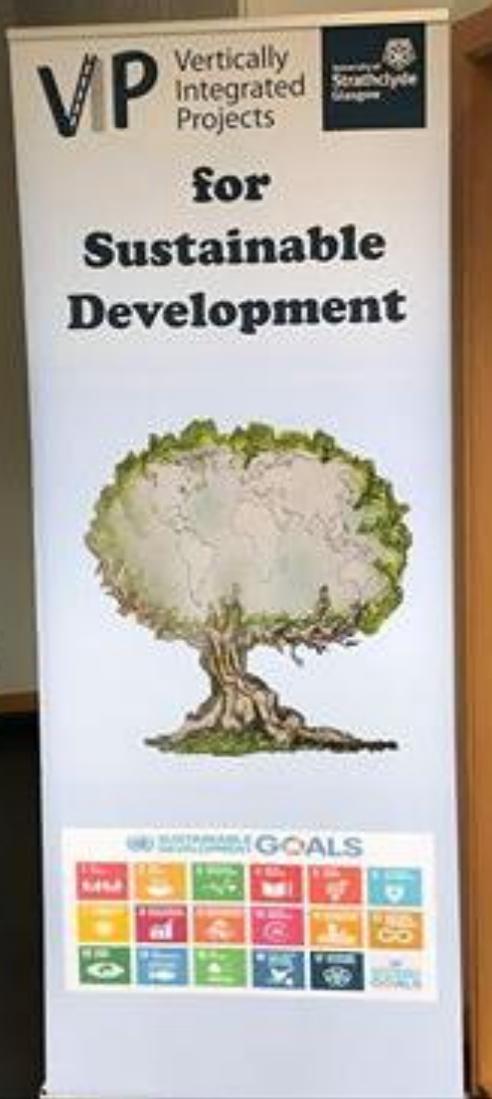


**Impact**





# for Sustainable Development Conference 2018

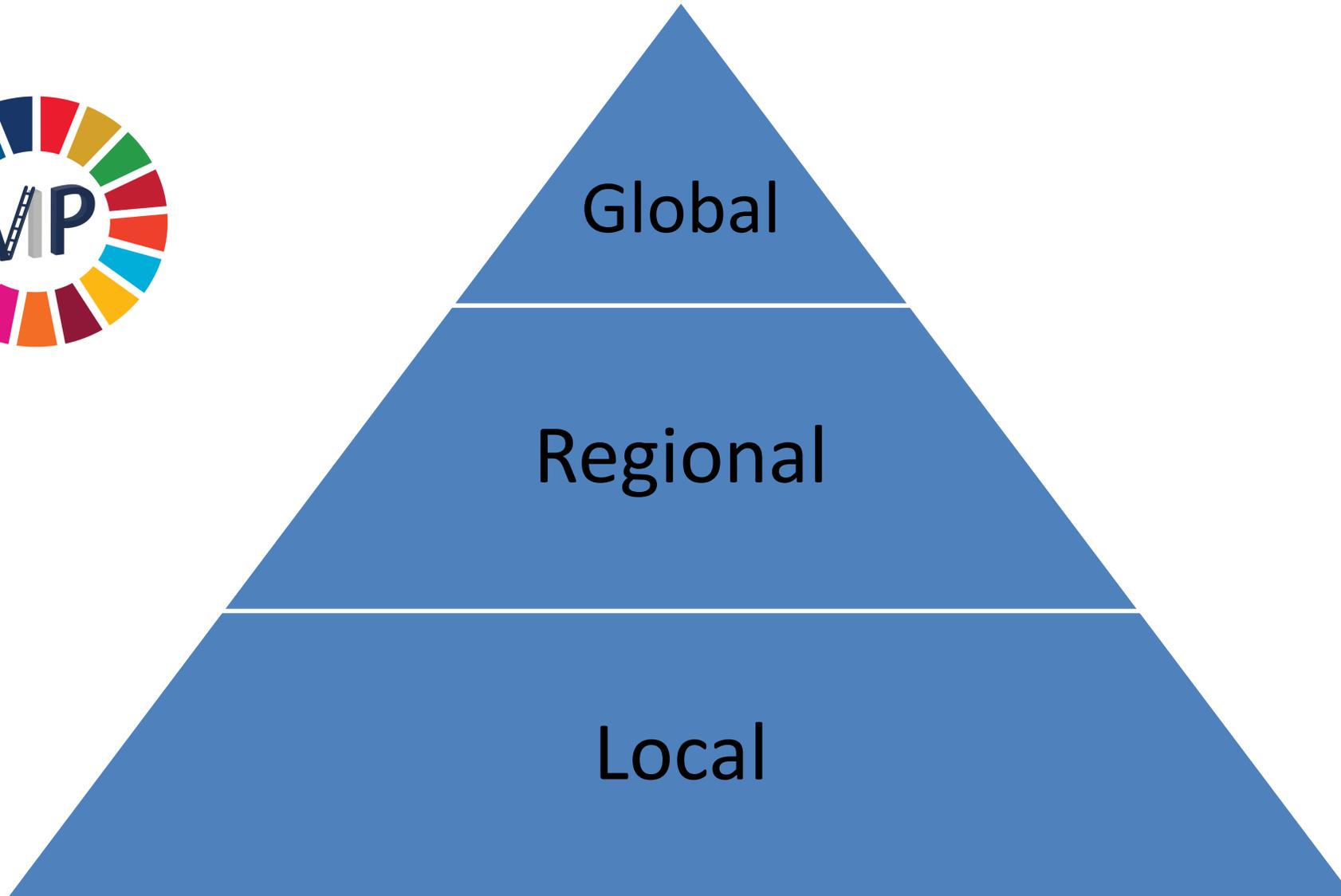




# for Sustainable Development Conference 2019



# 2019/20 Student Conferences



# Our Vision

# Institutionalise & Internationalise





# The Main Challenges

- Academic regulations,
- Changes required to existing curriculum,
- Assignment of academic credits,
- Degree accreditation requirements,
- Staff engagement and resource,
- Student recruitment,
- Assessment and supervision

# Our Vision

# Institutionalise & Internationalise



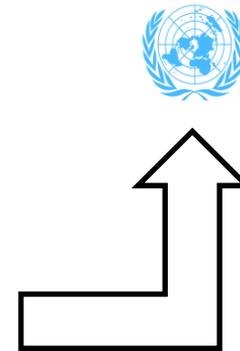
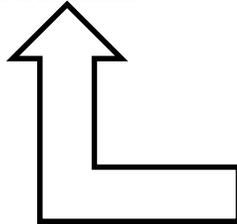
# Our Vision

# Institutionalise & Internationalise



CESAER

conference of european schools  
for advanced engineering education  
and research



ACKNOWLEDGED BY



# Our Vision

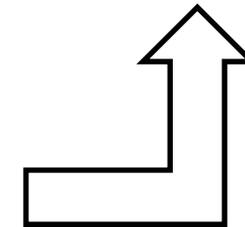
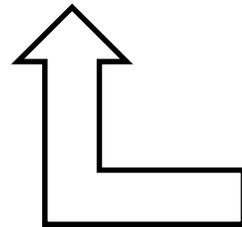
# Institutionalise & Internationalise



ACKNOWLEDGED BY



**UNITED NATIONS  
UNIVERSITY**



# ESD



**SDG**academy



- **SDG Academy – SDSN initiative to create and curate free, graduate-level online courses on sustainable development**
- **including health, education, climate change, agriculture and food systems, sustainable investment**

# SDSN Sites



# SDGacademy



SDSN



Sites ??



# 17 PARTNERSHIPS FOR THE GOALS



for

## Sustainable Development



**SUSTAINABLE  
DEVELOPMENT** **GOALS**

scott.strachan@strath.ac.uk

