



DEC Executive Briefing #009 | September 2024

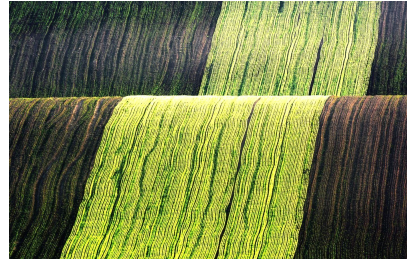
Measuring Sustainability in Higher Education

Key Takeaways



Varied Sustainability Roles of Higher Education

There are four common areas that higher education institutions can act on when building their sustainability strategy - Education, Research, Governance and Operations, and External Leadership. Each area capitalises on institutional strengths to enact sustainability initiatives that are aligned with and suited to institutional goals.



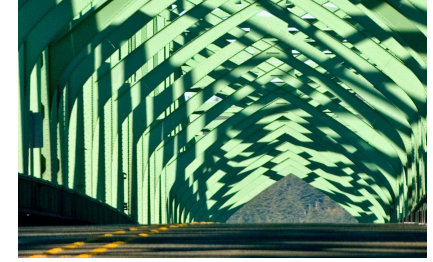
Prioritising as the Key to Sustainability Strategy

To navigate the overwhelming number of sustainability initiatives available, prioritisation is key to institutional success in sustainability. Institutions should consider the complexity and impact of each initiative when prioritising, focusing on both simple and complex high-impact initiatives while only pursuing low-impact initiatives if they are simple to implement.



Tackling the Complexity of Sustainability Initiatives

Prioritising sustainability initiatives and creating a clear roadmap requires institutions to categorise them by complexity into three groups: Quick Wins, Core Builders, and Advanced Undertakings. This is based on two factors: resource intensity (e.g., expertise and funding) and ease of implementation (e.g., stakeholder involvement and process changes).



Measurement and Disclosure of Initiatives

Measuring sustainability progress and determining disclosure can be centred around identifying and defining institution practices in these six aspects - institutional purpose, stakeholder engagement, governance for sustainability, opportunities and risks, horizon setting, and ethical standards.

Table of Contents

1. Defining Sustainability for Higher Education	4-9
Key Challenges for Sustainability in Higher Education	
Sustainability in Higher Education	
Sustainability Strategy Maturity Self-Assessment	
Prioritising is Key to a Successful Sustainability Strategy	
Sustainability Priority = Initiative Complexity x Initiative Impact	
2. Classifying Sustainability Initiatives	10-13
Classifying Sustainability Initiatives by their Complexity	
Complexity Assessment Guide for Sustainability Initiatives	
Sustainability Initiatives at Three Complexity Level: Examples	
3. Determining Impact of Sustainability Initiatives	14-16
Prioritising Sustainability Initiatives	
Impact Evaluation Guide for Sustainability Initiatives	
4. Planning and Communications	17-20
Initiatives Roadmap: Key to Measurement and Progress Tracking	
An Industry Benchmark: Times Higher Education Impact Rankings	
Measuring and Disclosing Sustainability	
5. Startups to Watch	21-35

1. Defining Sustainability for Higher Education

Key Challenges for Sustainability in Higher Education

1

Broad and Diverse Focus

- Sustainability initiatives and goals can have broad and different focuses, making it hard for institutions craft and execute their sustainability strategies due to a dilution of resources and personnel.
 - Institutions may find it difficult to choose specific goals and initiatives to narrow down their sustainability focus.
-

2

Varied Complexity and Timelines

- Large variety of initiative complexity and timelines results in difficulty in classifying which initiatives should be prioritised and determining project timelines for each initiative.
 - Overlapping and varying timeframes for different initiatives creates difficulty in planning and executing different phases.
-

3

Stakeholder Management

- Lack of clear governance structures for institutions to effectively manage and engage stakeholders and their expectations.
 - Institutions face difficulty in creating management structures due to lack of information about stakeholder capabilities and expectations, and fail to make use of stakeholders as a resource.
-

4

Tracking Progress

- Large number of overlapping and diverse initiatives and unclear metrics make tracking progress for sustainability complicated and administratively arduous.
 - Institutions may find it hard to break down goals and initiatives into actionable tasks with clear objectives and metrics that can be tracked. This makes it difficult to keep the initiative on track and retain stakeholder support.
-

Sustainability in Higher Education

Education

- Sustainability incorporated into curricula and programmes
- Faculty training on sustainability



Research

- Research on sustainability
- Research centres for sustainability
- Sustainability innovation and technology transfer



Governance & Operations

- Zero waste campus
- Carbon-neutral organisations
- Compliance, auditing, and assessment



External Leadership

- Collaboration with institutions, business, and authorities
- Engagement in sustainability events
- Policy advocacy



Sustainability Strategy Maturity Self-Assessment

This self-assessment serves as a tool for institutions to define the maturity level of their sustainability strategies, so as to identify core strategic components that are lacking.

	Not Mature Nil or Unclear Strategy	Moderately Mature Strategy in place	Mature Well-communicated Strategy
Objectives & Goals	Sustainability goals are unclear and broad	Sustainability goals and objectives are defined. Communications are mostly generic	Sustainability goals are well-defined and communicated clearly
Timeline & Roadmap	Timeline for sustainability initiatives is undefined and there is no roadmap of initiatives	Timeline is defined and there is a roadmap for initiative implementation	Timeline and roadmap is well-defined and well communicated to stakeholders
Resources	Resources needed for sustainability initiatives are unknown and lacking	Resources needed are identified and some have been secured	All resources needed have been identified and secured through developmental and operational phases
Stakeholder Engagement	Stakeholders involved are unclear	Stakeholders and responsibility are identified	Stakeholders are identified and are well aware of their responsibilities
Measurements	Sustainability measurements and reporting are not formalised	Sustainability measurements and reporting are defined	Sustainability measurements and reporting are well defined, communicated and understood

Prioritising is Key to a Successful Sustainability Strategy

Given the broad scope of sustainability and the numerous ways institutions can contribute to the 17 Sustainable Development Goals (SDGs), it is essential for institutions to prioritise their efforts to effectively allocate resources and achieve success in their sustainability journey.

Institutions can identify and prioritise their sustainability initiatives by evaluating two key dimensions: the complexity of the initiatives and the potential impact they can generate.

Complexity

Complexity is determined by:

- **Resource intensity:** The range and amount of resources required to implement the initiative, including expertise, fund, personnel, and infrastructure and technology needs.
- **Ease of implementation:** The level of collaboration and organisational changes needed to execute the initiative.

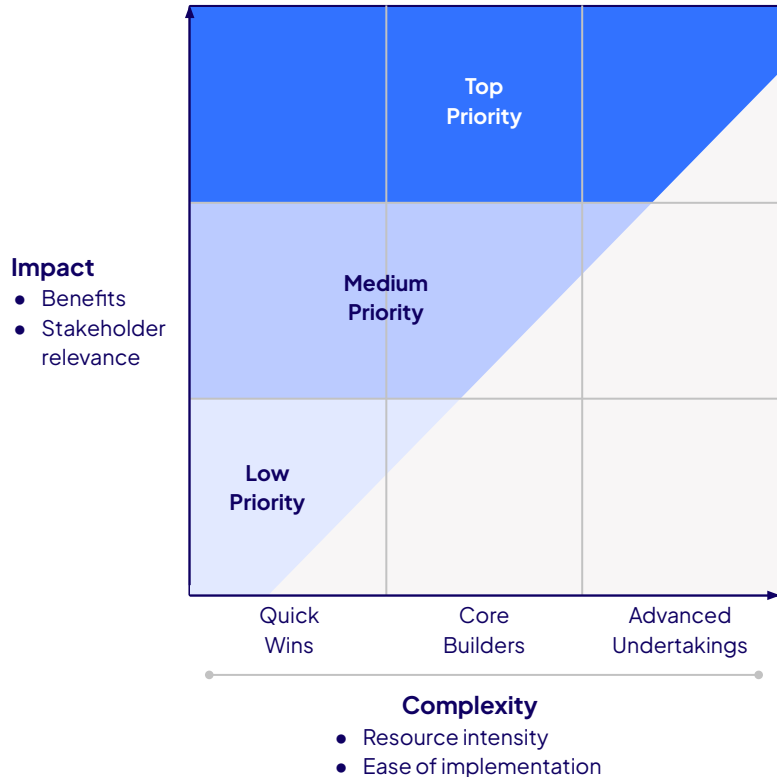
X

Impact

The impact of an initiative can be assessed by considering:

- **Benefits:** Positive environmental and social impact and contribution to the institution, such as financial returns and reputation enhancement.
- **Stakeholder relevance:** How well the initiative aligns with the needs and expectations of the institution's key stakeholders, including faculty, students, the broader community, and the government.

Sustainability Priority = Initiative Complexity x Initiative Impact



Top priority area encompasses a broad range of initiatives with high impact

Institutions' top priority areas should include a diverse mix of sustainability initiatives, spanning quick wins, core builders, and advanced undertakings to ensure both short-term impact and long-term transformation.

Medium priority area focuses on initiatives with moderate complexity and impact

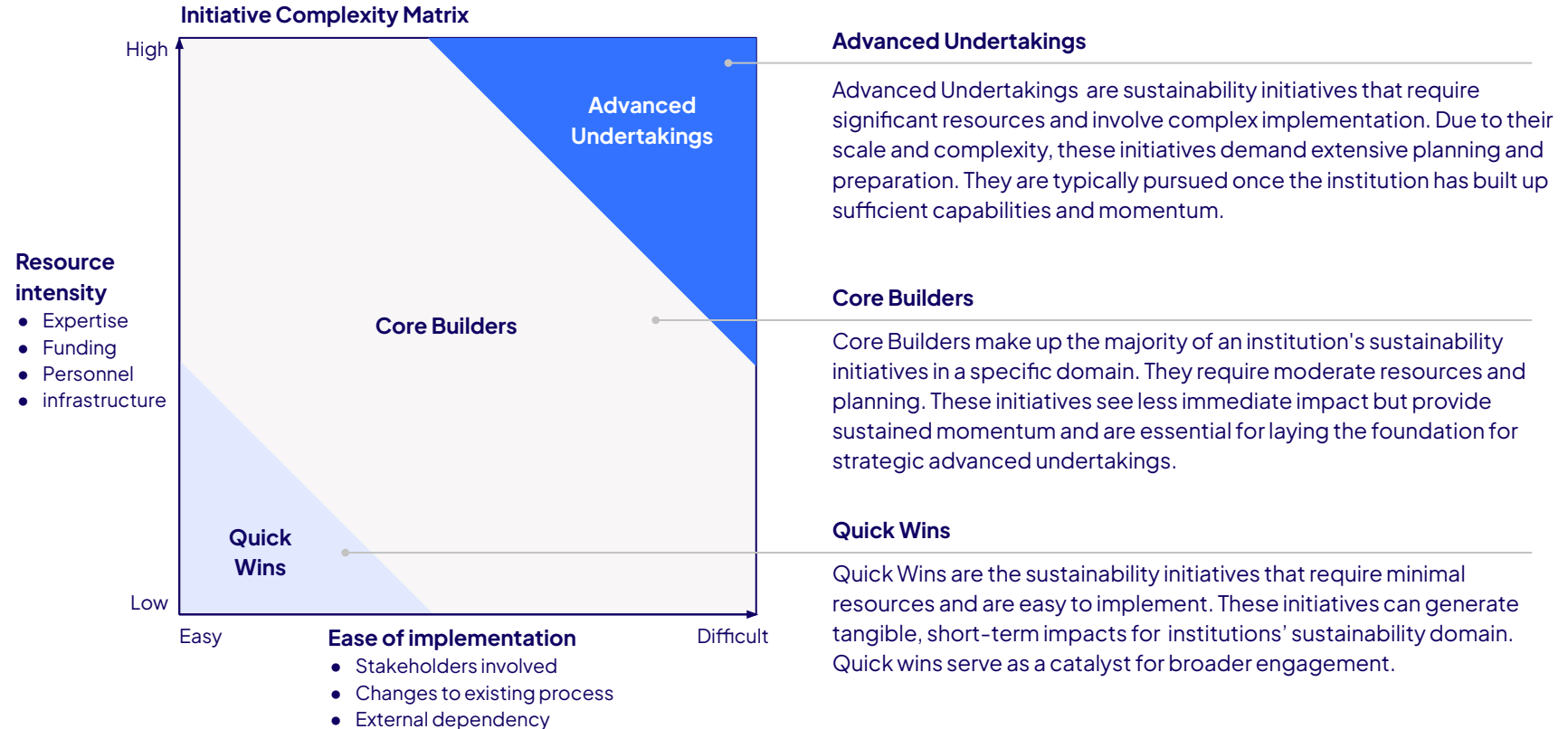
For medium priority area, institutions should concentrate on quick wins and core builders, focusing on initiatives that are manageable with current resources while deferring more resource-intensive, complex initiatives.

Low priority area limits focus to low complexity initiatives for initiatives with low impact

In low priority area, institutions should allocate minimal resources, focusing only on quick wins that can deliver tangible results with little investment despite the limited impact.

2. Classifying Sustainability Initiatives

Classifying Sustainability Initiatives by their Complexity



Complexity Assessment Guide for Sustainability Initiatives

$$\text{Initiative Complexity} = \text{Resource Intensity} \times \text{Ease of Implementation}$$

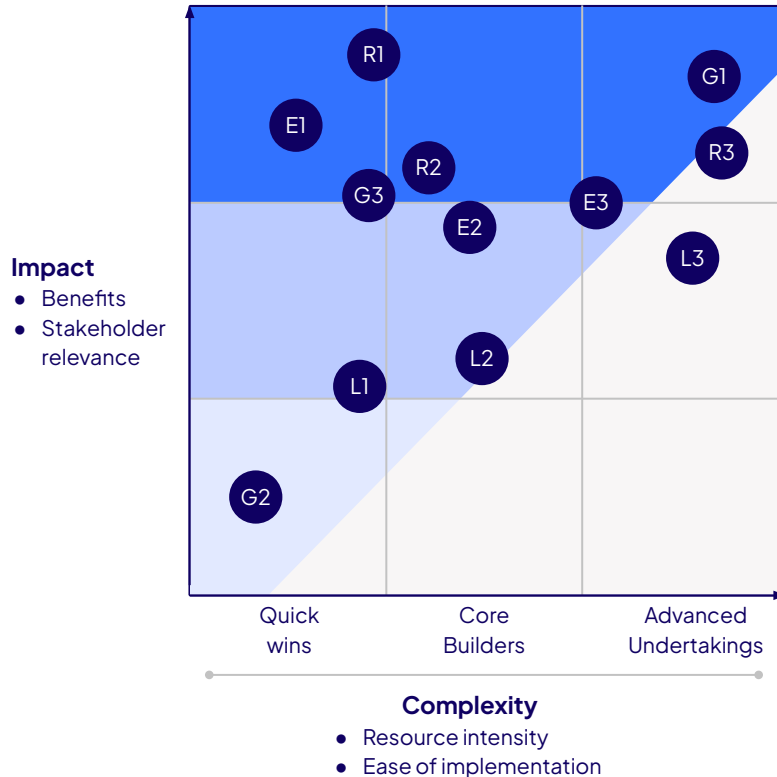
Resources Intensity	Expertise Expertise and knowledge needed to implement this initiative	Minimal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extensive
	Funding Financial resources needed to implement this initiative	Minimal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extensive
	Personnel Personnel needed to implement this initiative	Minimal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extensive
	Infrastructure & Technology New infrastructure & technology needed to implement this initiative	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extensive
Ease of Implementation	Stakeholders involved Number and profile of stakeholders need to engage to implement this initiative	Very few	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extensive
	Changes to existing processes New changes introduced to existing processes by this initiative	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extensive
	External dependency External dependencies on supplier, partners, and policy makers for this initiative	Very low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very high

Sustainability Initiatives at Three Complexity Level: Examples

	Education	Research & Innovation	Governance & Operations	External Leadership
Level 1 Quick Wins	<ul style="list-style-type: none"> Maintain and increase student enrolment in programmes align with SDGs Integrate sustainability project into existing courses and subjects Mental health support for students and staff (link) 	<ul style="list-style-type: none"> Expand research on sustainability topics (link) Offer internal funding to research on sustainability topics (link) Host SDG-focussed seminars, workshops and conferences 	<ul style="list-style-type: none"> Implement recycling and waste reduction programmes Launch awareness campaigns Revise existing institution policy (e.g. equality, diversity) Public transit incentives (link) 	<ul style="list-style-type: none"> Organise local community events Engage students in sustainability volunteering opportunities (link)
Level 2 Core Builders	<ul style="list-style-type: none"> Create dedicated sustainability courses, minor, and certificate programmes (link) Organise interdisciplinary student experiential learning projects on sustainability (link) Develop educator's guide for sustainability (link) Launch MOOC on sustainability (link) 	<ul style="list-style-type: none"> Collaborate with local government and authority for research projects (link) Corporate sponsored research on specific sustainability topics Expert advisory on sustainability Targeted sustainability research funding (link) SDGs data hub (link) Establish impact investment fund (DEC members refer to EB008) 	<ul style="list-style-type: none"> Develop responsible procurement policies (link) Improve accessibility facilities Set carbon budget for institution operation (link) Install on-site renewable energy Electrify campus fleet Reduce or eliminate disposable packaging (link) Digitise administrative processes (link) 	<ul style="list-style-type: none"> Host sustainability conferences (link) Partner with local governments or NGOs to run projects on sustainability (link) (link) Participate in regional, national, or international sustainability consortia (link) Partner with institutions to advance research and educational programs (link) Research-informed policy briefs
Level 3 Advanced Undertakings	<ul style="list-style-type: none"> Establish full sustainability degree programmes (link) 	<ul style="list-style-type: none"> Dedicated interdisciplinary research centre for sustainability (link) Commercialise sustainability innovation through spin-outs and licensing 	<ul style="list-style-type: none"> Switch to 100% renewable energy (link) Carbon-neutral organisation (link) Build sustainable supply chain 	<ul style="list-style-type: none"> Policy advocacy Research and set standards for regional, national and international sustainability practices

3. Determining Impact of Sustainability Initiatives

Prioritising Sustainability Initiatives



Education

- E1** Integrate sustainability topics into existing courses and subjects
- E2** Launch MOOC on sustainability
- E3** Establish full sustainability degree programmes

Research

- R1** Expand research on sustainability topics
- R2** Targeted sustainability research funding
- R3** Create sustainability spin-outs

Governance and Operation

- G1** Carbon-neutral organisation
- G2** Launch awareness campaigns
- G3** Improve accessibility facilities

External Leadership

- L1** Engage students in sustainability volunteering opportunities
- L2** Host sustainability conferences
- L3** Policy advocacy

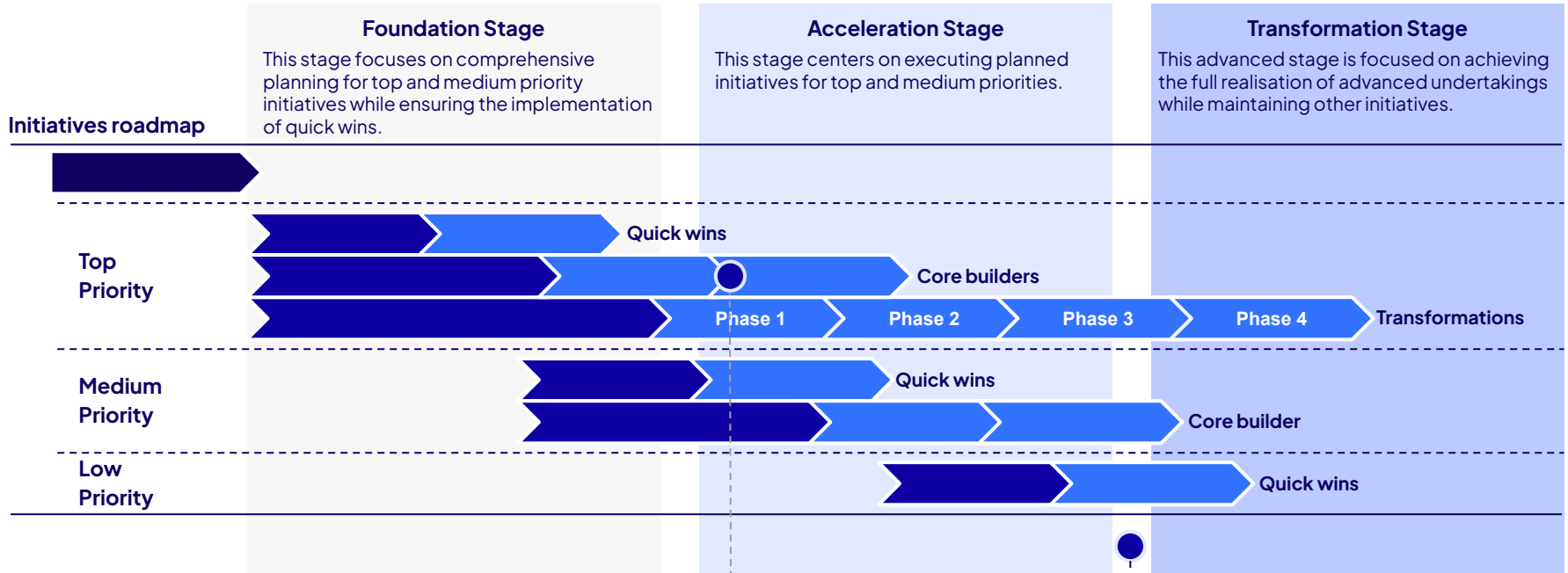
Impact Evaluation Guide for Sustainability Initiatives

Sustainability Priority = Initiative Complexity X Initiative Impact

Benefits of Sustainability Initiative	Environmental & societal benefits Direct, indirect, and induced positive impact	Very low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very high
	Reputation and branding benefits Ranking, reputation, attractiveness to prospective students and staff, visibility	Very low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very high
	Financial benefits Cost saving, revenue generation, long-term ROI	Very low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very high
Stakeholder Relevance of Sustainability Initiative	Relevance to faculty expectations Align with faculty research, professional development and funding opportunities	Very low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very high
	Relevance to student expectations Career development, student experience	Very low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very high
	Relevance to community needs Pressing challenge, tangible impact for local community	Very low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very high
	Regulation & government priority Regulatory compliance and relevance to government priorities	Very low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Very high

4. Planning and Communications

Initiatives Roadmap: Key to Measurement and Progress Tracking



Set specific timeline and milestones for each initiative, which serve as the foundation for progress tracking.

At the end of each stage, institutions need to report on the progress and review the priority of the initiatives.

An Industry Benchmark: Times Higher Education Impact Rankings

Methodology

Ranking is based on the score of SDG 17 and three other best performing SDGs.

SDG1 No Poverty

- Research on poverty
- Proportion of students receiving financial aid
- University anti-poverty programmes

SDG2 Zero Hunger

- Research related to hunger
- Campus food waste
- Student hunger
- Proportion of graduates in agriculture and aquaculture
- National hunger

SDG3 Good Health and Wellbeing

- Research on health and well-being
- Proportion of health graduates
- Collaborations and health services

SDG4 Quality Education

- Research on early years and lifelong learning education
- Proportion of graduates with teaching qualification
- Lifelong learning
- Proportion of first-generation students

SDG5 Gender Equality

- Research
- Proportion of senior female academics
- Proportion of women receiving degrees
- Women's progress measures

SDG6 Clean Water and Sanitation

- Research on clean water and sanitation
- Water consumption
- Water usage and care
- Water reuse
- Water in the community

SDG7 Affordable & Clean Energy

- Research on affordable and clean energy
- University measures towards affordable and clean energy
- Energy use
- Energy and community

SDG8 Decent Work and Economic Growth

- Research on this topic
- Employment practices
- Expenditure / employee
- Proportion of students taking work placements
- Proportion of employees on secure contracts

SDG9 Industry, Innovation and Infrastructure

- Research on this topic
- Patents citing university research
- University spin-offs
- Research income from industry

SDG10 Reduced Inequalities

- Research on this topic
- First-generation students
- Students from developing countries
- Students and staff with disabilities
- Measures against discrimination

SDG11 Sustainable Cities and Communities

- Research on sustainable cities and communities
- Support of arts and heritage
- Expenditure on arts and heritage
- Sustainable practices

SDG12 Responsible Consumption and Production

- Research on this topic
- Operational measures
- Proportion of recycled waste
- Publication of a sustainability report

SDG13 Climate Actions

- Research on climate action
- Low-carbon energy use
- Environmental education measures
- Commitment to carbon-neutral university

SDG14 Life Below Water

- Research on this topic
- Supporting aquatic ecosystems through education and action
- Water-sensitive waste disposal
- Maintaining a local ecosystem

SDG15 Life on Land

- Research on this topic
- Supporting land ecosystems through education and action
- Land-sensitive waste disposal

SDG16 Peace, Justice and Strong Institutions

- Research on peace and justice
- University governance measures
- Working with government
- Proportion of graduates in law and civil enforcement

SDG17 Partnerships for the Goals

- Research on this topic
- Partnerships to support SDGs
- Publication of SDG reports
- Education on SDGs

Measuring and Disclosing Sustainability

Adapting industry best practices to higher education

These metrics are deliberately based on industry-agnostic best practices discussed in a number of publications¹.

The goal of the six pillars is to offer a more targeted approach to higher education, accelerating the adoption of globally recognised standards while promoting discussion and collaboration between institutions.

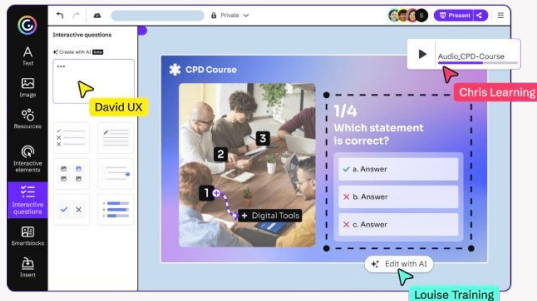


1. World Economic Forum, "Measuring Stakeholder Capitalism Towards Common Metrics and Consistent Reporting of Sustainable Value Creation" (December 2020)

5. Startups to Watch



Interactive Learning and Content Creation



Genially is a digital content creation platform for interactive learning, both in the classroom and online.

Genially provides multiple gamification features, such as live quizzes, escape game modes and more. It also provides assessment analytics such as engagement analytics and learner tracking.

Genially is also compatible with major LMSs and is GDPR compliant.

Key Features



Gamification

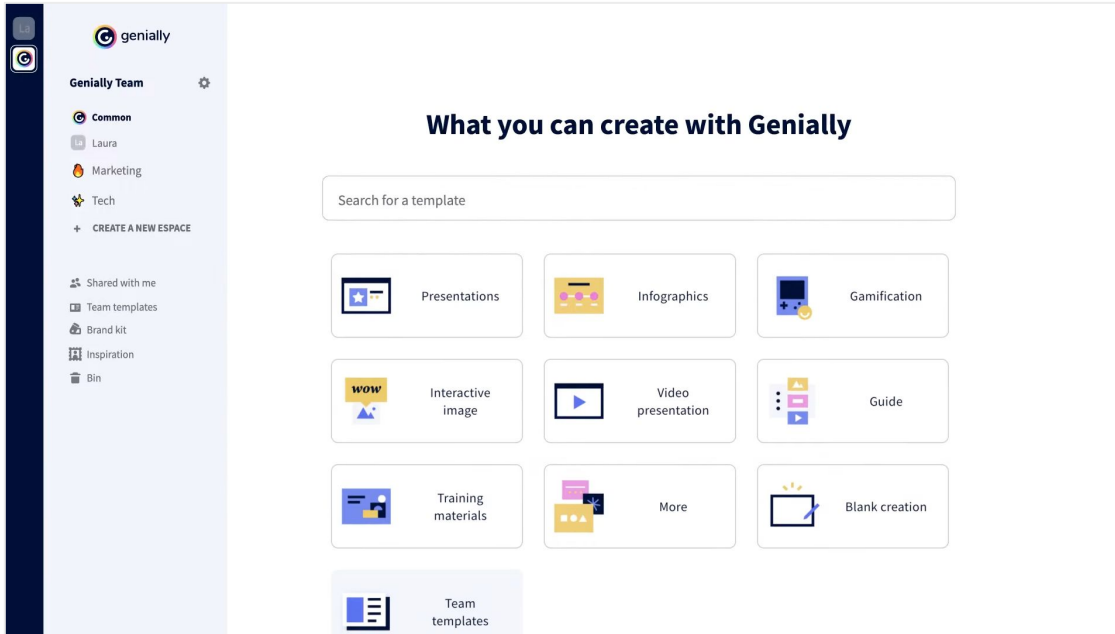


Real-time
Interaction



LMS Integration

Interactive Learning for Higher Education



The screenshot displays the Genially dashboard. On the left is a dark sidebar with the Genially logo and a navigation menu including 'Genially Team', 'Common', 'Laura', 'Marketing', 'Tech', and 'CREATE A NEW ESPACE'. Below this are sections for 'Shared with me', 'Team templates', 'Brand kit', 'Inspiration', and 'Bin'. The main content area is titled 'What you can create with Genially' and features a search bar labeled 'Search for a template'. Below the search bar is a grid of template categories: Presentations, Infographics, Gamification, Interactive image, Video presentation, Guide, Training materials, More, and Blank creation. At the bottom left of the grid is a 'Team templates' category.

Choose your canvas

- Various templates for presentations, infographics etc. available on Genially
- Keyword search is available
- Templates are organised by category for reference

Interactive Learning for Higher Education



Goal & objective tracker



Akihabara content repository



Music certificate



Higher education grades



Akihabara agenda



Synoptic table ii



Higher education portfolio



Higher education brochure



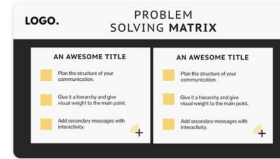
Digital design portfolio



Programming matrix



Educational certificate

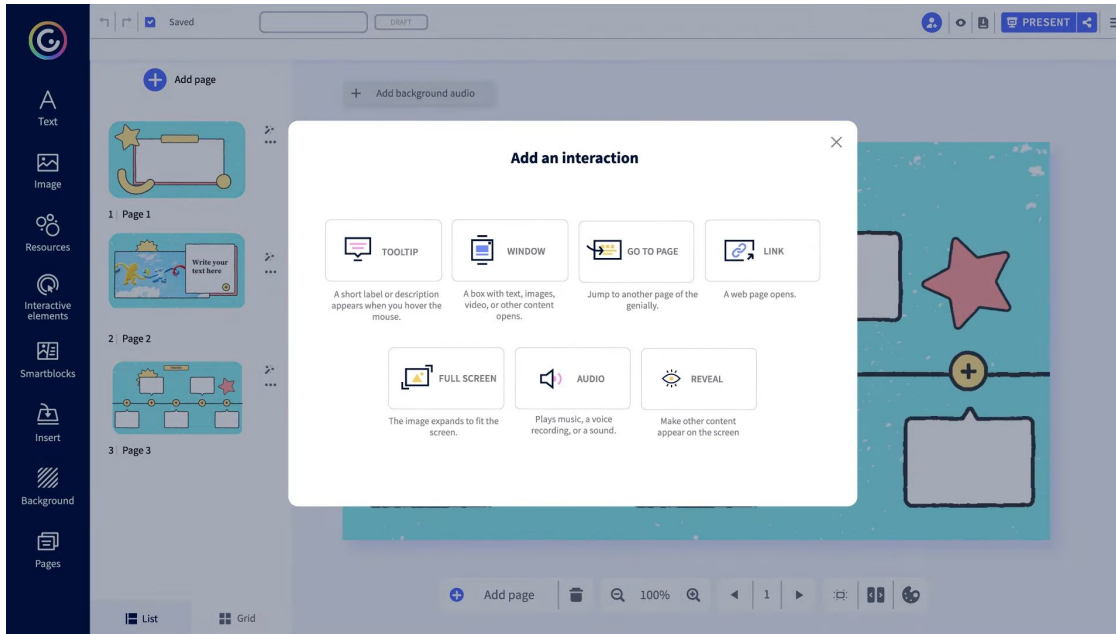


Problem solving matrix

Personalise and customise

- Various template available
- Upload your own material and branding if needed
- In-built content library of icons, photos and more available

Interactive Learning for Higher Education



Insert interactive elements

- Insert in-built no-code interactive elements into your material
- Choose from various interaction types, such as pop-up windows, audio notes and more

Gamification Features

Live Games



Includes features like interactive quizzes, team games, training sessions with live results, and participant leaderboards

Digital Escape Room



Escape game-themed feature that aims to immerse and engage students with storylines

Time-limited Features



Utilises time pressure through features like countdown timers or time limits for questions to engage students

Randomisation Features



Utilises elements of chance and surprise to engage students, with the aim of making learning less predictable



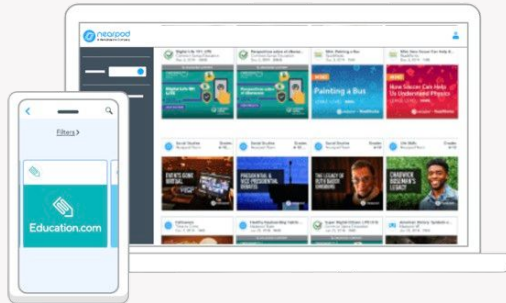
Interactive Learning Solution



2012



USA



Founded in 2012 in the USA, Nearpod is a solution for creating interactive learning both in classrooms and online.

Nearpod provides interactive and gamification aspects such as polls, VR field trips and more. It also engages educators through a badge system and a community network.

Nearpod can be integrated with major LMSs and is GDPR compliant.

Key Features



Gamification



**Engaging
Educators**



LMS Integration

How Nearpod works

Upload your lesson resources



Upload slides, videos, and documents or choose from lesson templates

Customise your materials



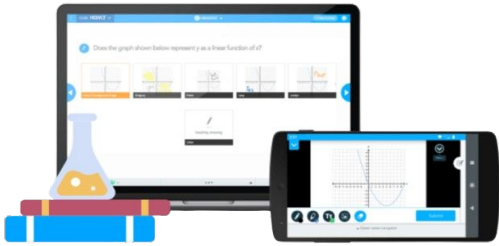
Turn them into interactive lessons using Nearpod's dynamic media materials

Conduct interactive lessons



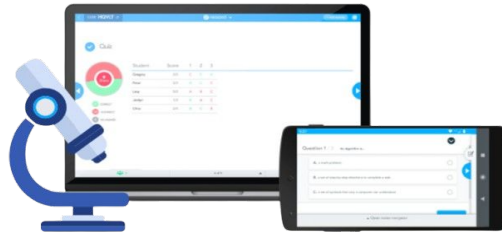
Receive real-time data on student engagement to guide teaching and improve student outcomes

Key Interactive Features



Draw it

A collaborative environment students can annotate shared material, draw, and upload PDFs for reference.



Quizzes

Gather real-time feedback on student understanding. Quiz results can be populated to certain LMS directly.



VR Field Trips

Immersive virtual field trips to a variety of locations. This interactive element aims to engage students by increasing immersion.



Stempad

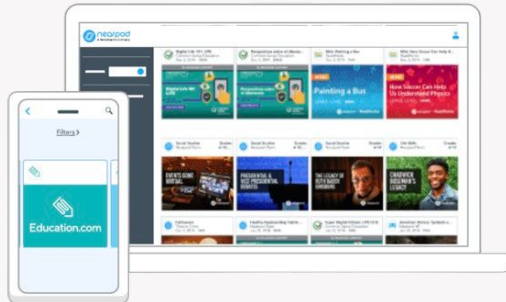
Math Authoring Solution



2012



USA



Founded in 2024 in the USA, Stempad is a Y Combinator-backed startup that serves as a flexible math and scientific authoring tool. Stempad utilises MathQuill to enable math authoring, and provides offline and collaborative features.

Stempad offers authoring solutions for all scientific disciplines, such as math, computer science, chemistry and more.

Stempad is GDPR compliant.

Key Features



**STEM
Disciplines**



Notes taking

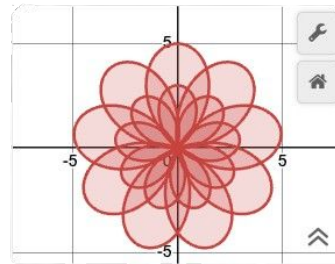


**Export and
Download**

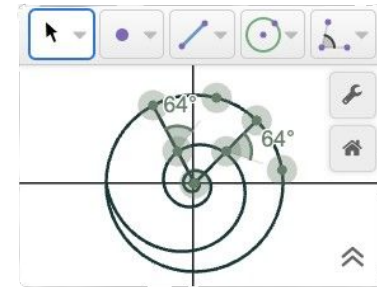
Math Authoring Features

$$S(x(t)) = \int_{t_1}^{t_2} L\left(x(t), \frac{d}{dt}x(t)\right) dt$$

Stempad provides an auto-formatting math block and also supports copying and pasting LaTeX



Stempad has an embedded Desmos graphing calculator for graphing needs

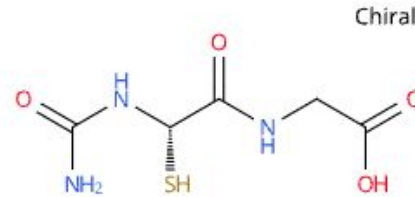


Stempad has an embedded Desmos geometry sketcher

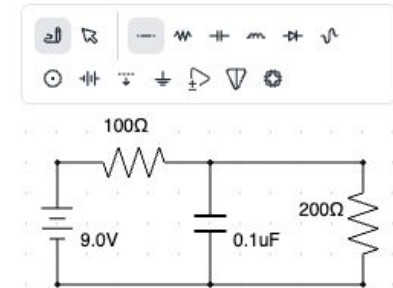
Authoring Features for other disciplines

```
Python ▾  
1 def fibonacci(n):  
2     a, b = 0, 1  
3     for _ in range(n):  
4         yield a  
5         a, b = b, a + b
```

Stempad provides syntax highlighting, multi-language support, and built-in VSCode keybinds

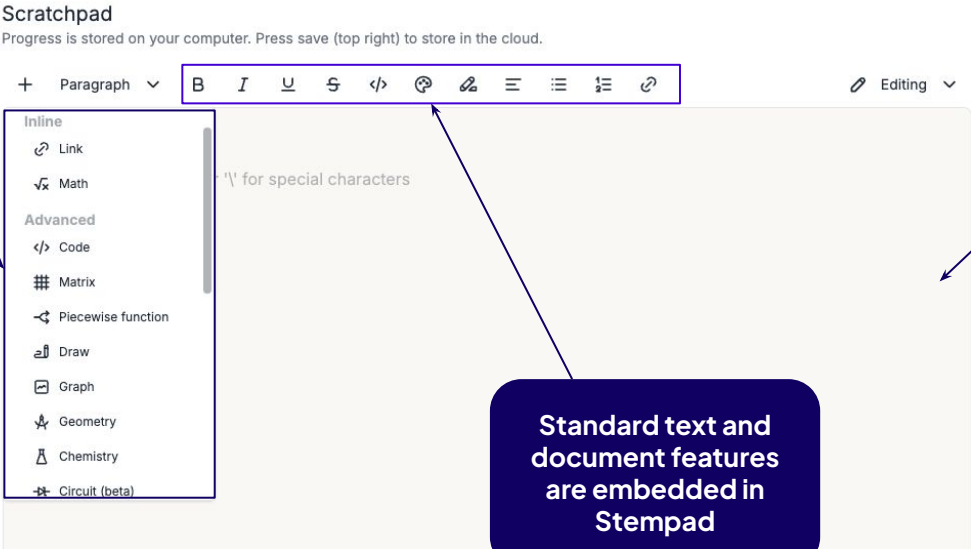


Stempad allows for drawing and editing chemistry models



Stempad allows for drawing and editing circuit schematics

How It Works









Choose authoring blocks based on your needs

Standard text and document features are embedded in Stempad

Authored content will be presented here

Scratchpad
Progress is stored on your computer. Press save (top right) to store in the cloud.

Paragraph **B** *I* U ~~S~~ `</>`       Editing

Inline

- Link
- Math

Advanced

- Code
- Matrix
- Piecewise function
- Draw
- Graph
- Geometry
- Chemistry
- Circuit (beta)

"\ for special characters

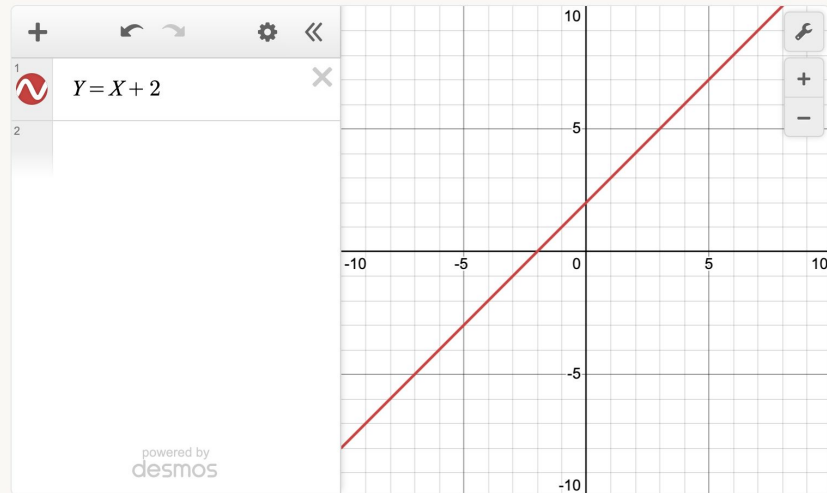
Example results

Scratchpad

Progress is stored on your computer. Press save (top right) to store in the cloud.

+ Paragraph \downarrow B I U S \langle / \rangle        Editing \downarrow


$$y = x^2 + 5$$




How It Works

Export

Choose a download type

 PDF

Beta TeX LaTeX

Beta  Markdown

Stempad provides various export functions

Reference ×

Keywords

- `sqrt` : Square root expression ($\sqrt{\quad}$)
- `sum` : Sigma notation expression (Σ)
- `int` : Integral expression (\int)
- `vec` : Vector arrow characters (\rightarrow)
- `hat` : Hat character ($\hat{\quad}$)
- `pi` : Pi symbol (π)
- `theta` : Lowercase theta symbol (θ)
- `rho` : Lowercase rho symbol (ρ)
- `phi` : Lowercase phi symbol (φ)
- `alpha` : Lowercase alpha symbol (α)
- `beta` : Lowercase beta symbol (β)
- `gamma` : Lowercase gamma symbol (γ)
- `delta` : Lowercase delta symbol (δ)
- `epsilon` : Lowercase epsilon symbol (ϵ)

References for shortcuts and keywords in all supported disciplines are provided to help with authoring



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