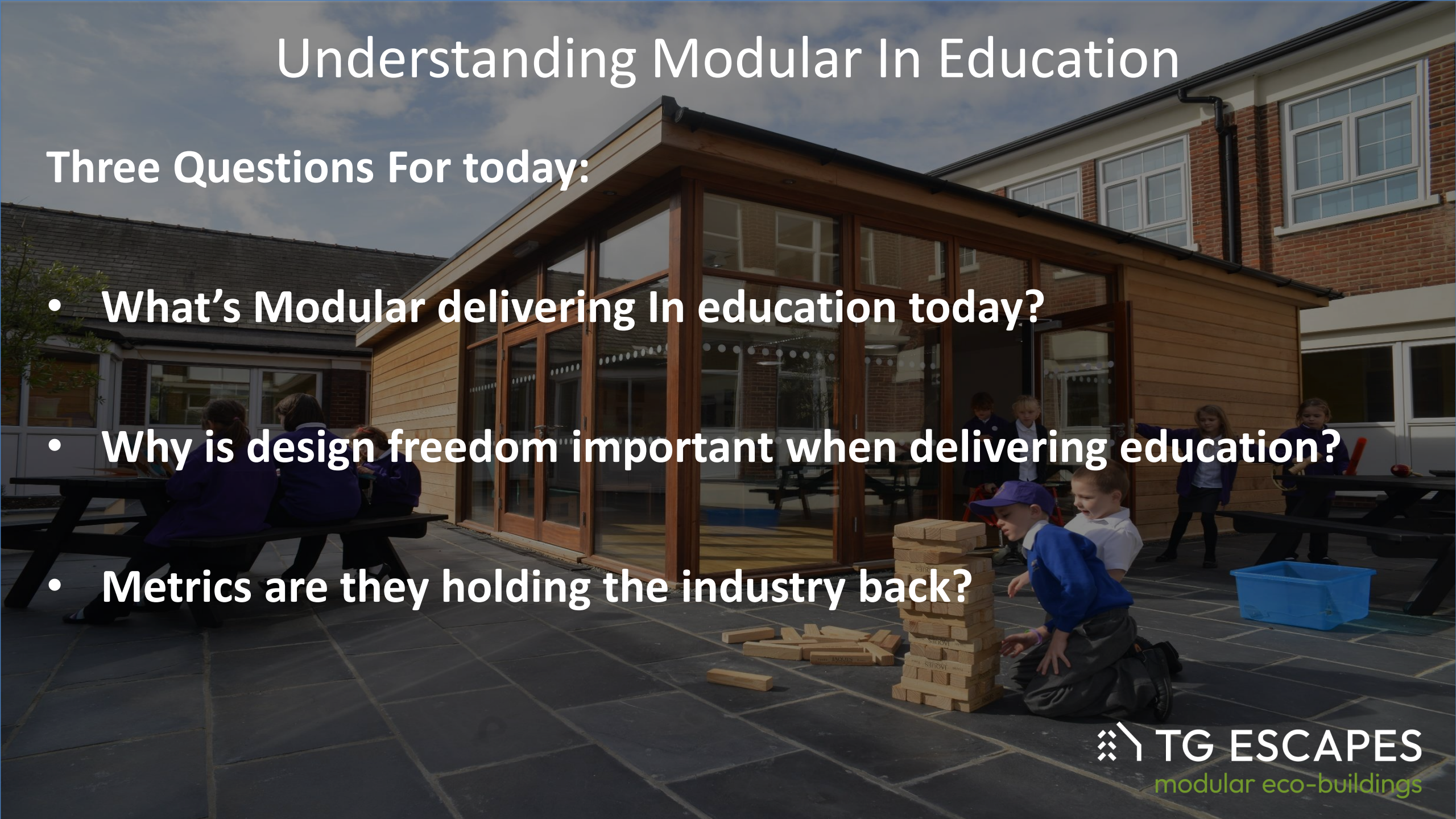
Modular Construction In Education: The Importance of Flexible Design

Understanding Modular In Education

Three Questions For today:

- **What's Modular delivering In education today?**
- **Why is design freedom important when delivering education?**
- **Metrics are they holding the industry back?**



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MPBA CAT 1 – Volumetric Modular

Volumetric Modular Types

Type A – Structural Chassis

Type B - Structural Chassis and internal fit out

Type C - Structural Chassis and internal fit out & External Cladding

Source: Reds10

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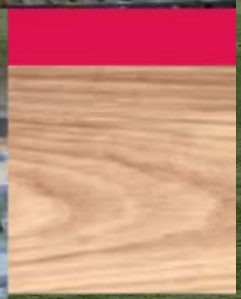

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MPBA CAT 2 – Sectional Modular

Sectional Modular Types

Type A – Structural Chassis

Type B - Structural Chassis with insulation / Linings

Type C - Structural Chassis with insulation / Linings & External Cladding and windows

Source: www.propertyinvestortoday.co.uk

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MPBA CAT 3 – PRE-MANUFACTURED (NON-SYSTEMISED STRUCTURAL)

Pre Manufactured Examples

- Internal and External Stairs
- Viewing Platforms and Handrail
- Canopies and Walkways
- Columns, Shear Walls or Beams
- Pre-Assembled Roof Structure
- Floor Slabs
- Curtain Walling
- Non-Excavation Foundation Products

Source: https://www.bucklandtimber.co.uk/blog/how-much-does-a-glulam-structure-cost/

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MPBA CAT 4&5 – Additive manufacture / Non structural

Source:. kamp C by jasmiens smets

Non Structural

- **Internal Partitions**
- **Bathroom Pods**
- **Kitchen Pods**
- **Plant Rooms**
- **Plug and Play M&E**

Pre-Manufactured Examples

- 3D PRINTING
- Modular factories
- Etc

Source:.
https://www.stonebathwear.com/steel-bathroom-pods/

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MPBA CAT 6 & 7 – NON MMC CONSTRUCTION METHODS

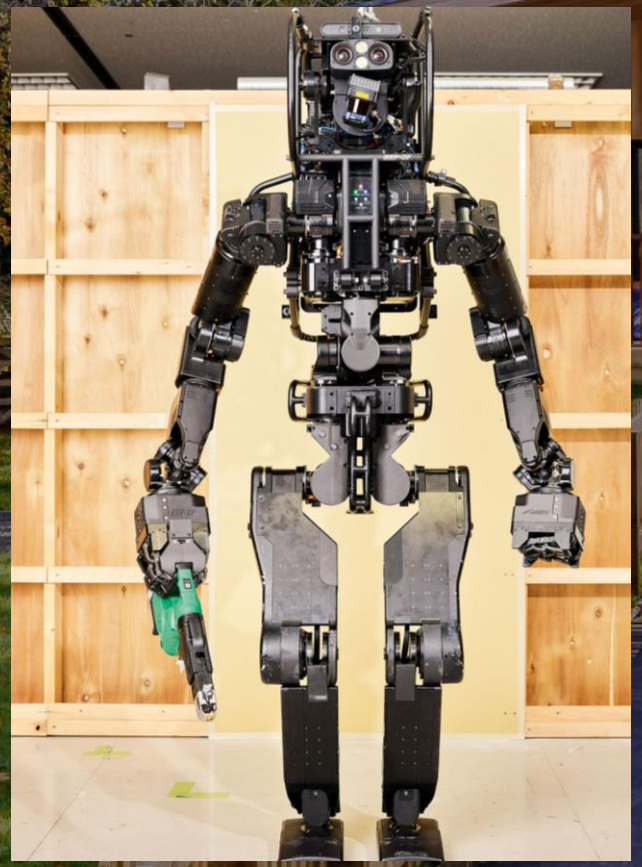
Cat 6 Examples

- Brick slips
- Flexible Pipes

Etc

Cat 7 Examples

- Survey Drones
- Automated Plant
- Wearable Tech



Source:.
https://www.wired.co.uk/article/robots-in-the-workplace

Source:.
https://www.thisislocallondon.co.uk/resources/images/12027005.jpg?type=responsive-gallery-fullscreen

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Why Design Flexibility ?

Design flexibility:

“allows designers to incorporate diverse architectural styles, materials, and layouts to meet the specific needs and preferences of clients and users.”

Standardisation:

“Standardisation can help maximise compatibility, interoperability, safety, repeatability, or quality. It can also facilitate a normalisation of formerly custom processes.”

While the two are complimentary, they don’t have to be exclusive. It is important that as a sector we find a balance, especially where design can have a profound impact on the end goal

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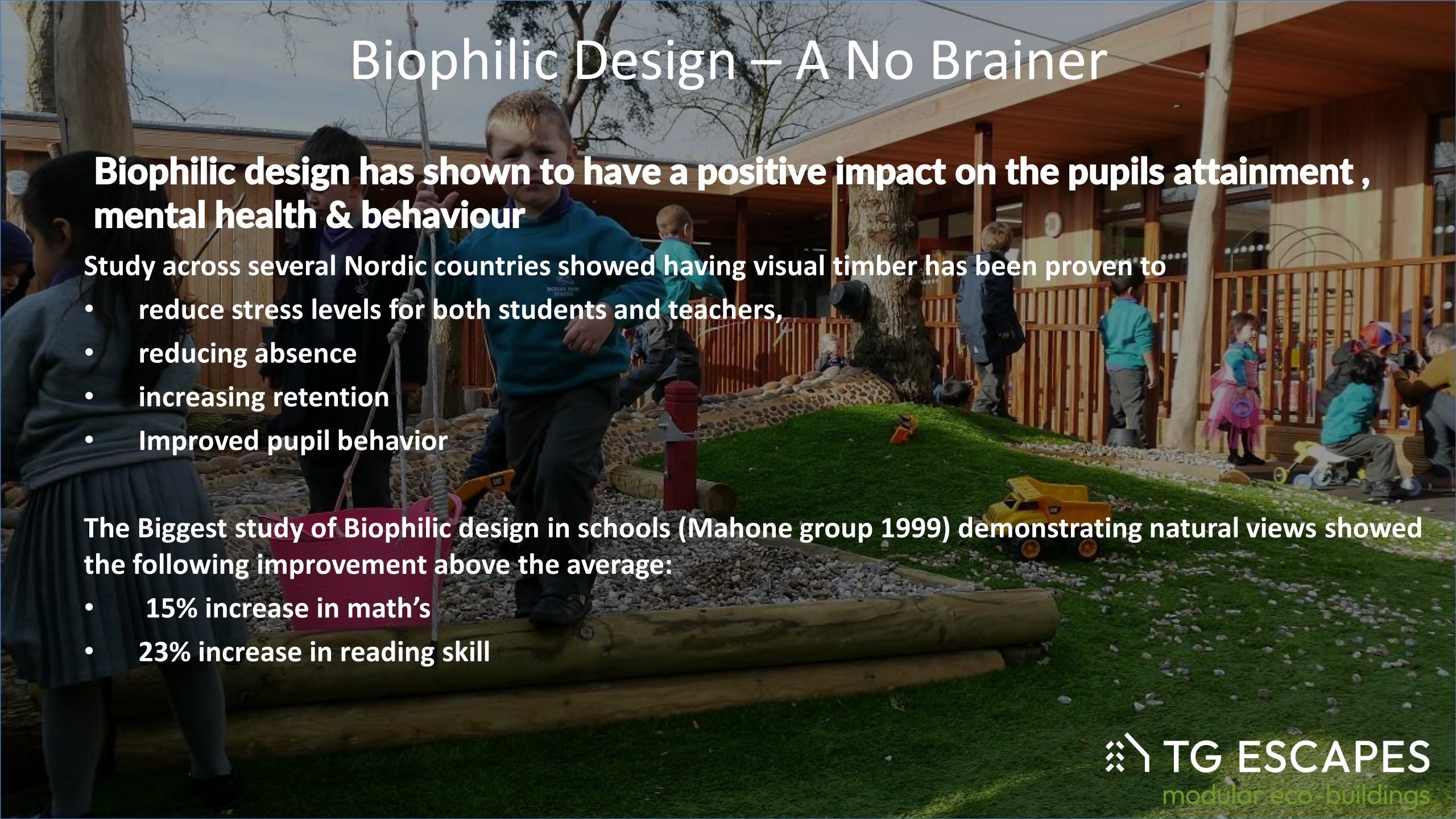
Biophilic Design – A No Brainer



Biophilic design has shown to have a positive impact on the pupils attainment , mental health & behaviour

Study across several Nordic countries showed having visual timber has been proven to

- reduce stress levels for both students and teachers,
- reducing absence
- increasing retention
- Improved pupil behavior

The Biggest study of Biophilic design in schools (Mahone group 1999) demonstrating natural views showed the following improvement above the average:

- 15% increase in math's
- 23% increase in reading skill

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When Standardisation when wrong

DFE standard schools - where the windows can't be opened, 27% of teachers work in a classroom where they can't open a window this rises to 56% in the Northeast

Why?

Because mechanical ventilation was utilised to meet the fresh air requirements

Passivehaus – In Scottland if you live in a Passivhaus before 2012 it was more likely to overheat than be too cold

Why?

Because there was such a focus on ensuring primary energy demand that the overheating was overlooked

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Square Pegs & Round Holes

All projects could be modular!

We need to select the right modular solution!

Area of Outstanding Natural Beauty

- It is unlikely to get Planning without some aspect of bespoke design.

Access Issues

- Not all sites have good access; you may not be able to utilise a crane or only have access for rigid transport

Incorporating nonstandard spaces

- Sports halls , dance studios, arts and drama, & SEND

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Meeting Changing Project Need

Delivery Gap

"is the difference between what the client wants and what is delivered by the service provider."

Bridging the Gap:

- **Engagement with the End user & Client.**
- **Minimise structural elements – give the clients more options to change in future**
- **Design with the future in mind – changing needs, economies of scale**

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Incorporating Flexibility into Standardised Solutions

Some Key rules:

- Make the standard fit the end users' needs.
- Just because something isn't in the standard doesn't mean it's not important
- Look for ways of maintaining flexibility for longer
- Ensure you are not trying to fit a square peg in a round hole.

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Case Study 1 – Access

Bamburgh School

The site was enclosed on all four sides and the area to offload, and crane was behind a two-storey part of the school

Solution – Man handlable elements brought through the existing school on trolleys

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Case Study 2 – Design

Deepcut Sports

The developer wanted to utilise modular to deliver however the DRP process wanted a bespoke building to be a local feature

Solution :

Utilise sectional modular to deliver a compliant design in a modular way

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Case Study 3 – Flexibility

Balcaras School

A new school being constructed for the trust was unfortunately delayed therefore the trust decided to combine its trusts office project with temporary accommodation for incoming intake

Solution :

Utilise sectional modular to deliver a design which would be retrofitted into offices after one year

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Re-cap

All Projects can be modular! - We need to ensure we pick the right system

Projects with bespoke and flexible designs can be delivered in a modular way!

We just need to:

- Understand the end user
- Make sure our standard or system doesn't dictate but enhances our offer
- Use our knowledge of the end user to meet the standard way which meets their need
- Modular is beyond boxes and panels: utilise the right system to meet your constraint

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