

Contemporary Challenges Presentation Supporting Document

AI Acknowledgement:

We confirm that we have not used any AI tools in the research and creation of this assignment. We confirm that we have not presented any AI generated materials as my own work. We confirm we have copies of our drafts, notes, and other resources used, which we may be asked to provide in evidence.

Introduction

Slide 2

Introduce group, Megan will be presenting in Welsh. This presentation will explore our experience using the design thinking process to create a prototype concept that aims to address real-world challenges faced by neurodiverse children in educational environments.

Slide 3

Design Thinking is a process of design that focuses in on a single issue and utilises cognitive and practical strategies focused on empathy to design a single solution that prioritises end users.

Slide 4

Design thinking has shown to be highly successful when properly applied, resulting in a number of recognisable design solutions. Examples include; Nike's Air Force One's, designed to be both comfortable and functional specifically for athletes

Slide 5 - Empathise

To begin this project, we first needed to decide on who our clients/users were and develop our understanding of their needs and the issues they may encounter in daily life. This was done by taking our basic idea of the people we wanted to work with in the future, and creating a theoretical profile of their life and experiences. We chose to examine how a neurodiverse child might experience the world.

This profile was then used to examine how a person might feel, what they may say or think, and how they may behave while engaged with different activities. This allowed us to explore how an individual's experience might change throughout the duration of an activity and how their external behaviours may not always represent their internal experience.

Slide 6 - Define

Our next step was to define the exact issue we would be addressing for our chosen individuals. This meant further exploring the 'Pains', or negative experiences of our clients, and the 'Gains', or positive experiences of our clients.

For neurodiverse students in a classroom setting, sensory issues, **social anxiety**, **insufficient instruction**, **distrust of support** and **feeling patronised** can impact a learning.

Neurodiverse learners are highly likely to suffer from additional mental health conditions, such as depression and anxiety. These can often either develop because of their struggles managing their extra needs or be greatly exasperated by them.

Insufficient or unclear instructions can leave neurodiverse students who need very clear direction uncertain of how to progress and prevent them from becoming active participants in their own learning or from having full access to all resources available. Common strategies to make instructions more accessible and varied is to provide them in different formats. These can include; visual aids, games, gestures, digital formats, written instructions, examples, using objects, and allowing discussion.

Negative past experiences with teachers and support staff can leave students resistant and suspicious of support offered to them, preventing them from making full use of the opportunities available.

An extension of this issue is that neurodiverse learners can often feel misunderstood and invalidated by educators and support staff. One study noted that even councillors can sometimes fail to appreciate the issues students face and leave them feeling patronised and without help.

Numerous sensory factors in a school or teaching environment can influence the behaviours and learning outcomes of neurodiverse children.

Common negative sensory experiences found in learning environments include bright lighting, vivid colours, pattern glare, echoing, variation in sound pitch and background noise. While these sensory stimuli may be irrelevant to neurotypical learners, they can become distracting or even overwhelming inputs for children with different sensory processing, contributing to behaviour and learning responses that decrease the potency and potential of lessons.

The heightened sensitivity to sensory inputs can often result in negative outcomes such as fear, avoidance behaviours, heightened vigilance and even aggression towards learning environments.

These responses can then further impact on academic engagement, social participation, and a student's ability to adapt or complete essential tasks. Children with sensory processing issues show overall lower participation and engagement in school activities compared to what neurotypical students tend to display.

This evidence suggests a critical need for education settings that are more sensory-friendly and willing to support the inclusion and development of all learners, by accommodating the needs of neurodiverse students.

With our understanding of these issues, we began asking questions of how we could combat each one, and what the positive outcomes of such an intervention could be. This led to us choosing an issue to address that we could understand from the point of view of our clients and ensured we would ideate and prototype our solution in a way that centred their needs.

Slide 7

We chose to address the question of how we can manage sensory issues in an educational setting?

Slide 8 - Ideate

With our question in mind, we began brainstorming and researching ways to support children with sensory issues in an educational setting. Some of the primary concepts we observed was the need to make students feel comfortable and allow them control over managing their own needs independently.

Slide 9 – Venue

After exploring these solutions, we received the venue of the Yr Egin Garden as a space to address our issue of sensory difficulties during learning. Research suggests learning in the outdoors can circumvent many of the sensory issues associated with traditional education styles. Neurodiverse students can independently manage sensory regulation with more ease and frequency in a natural environment, and this has led to observations of increased academic participation for these students when in outdoor settings.

Slide 10

However, being outdoors also introduces new issues to be addressed regarding sensory issues specific to the location. Sensory issue can pose major barriers to proper learning outdoors. In addition to general sensory issues, some examples of issues specific to the outdoors can be high or low temperatures, noise pollution (especially with the garden so close to a road), light sensitivity and a lack of sensory-friendly environments. Multiple studies noted the need for recovery areas outdoors.

Turn over to slide 11

Taking the venue into account alongside the solutions we had considered, this led us to begin conceptualising our prototype. We decided on the concept of an outdoor sensory room to make the support available in classrooms more accessible when learning outdoors.

Sleid 11

Dechreuwyd y prosiect prototeip sied synhwyrdd i greu amgylchedd tawelu, amlsynhwyrdd wedi'i deilwra ar gyfer unigolion ag anghenion prosesu synhwyrdd. Y nod oedd dylunio gofod pwrpasol, hunangynhwysol a allai gefnogi rheoleiddio emosiynol, lleihau straen, a darparu gwerth therapiwtig mewn lleoliadau addysgol a gofal. Dechreuodd y cynllunio gyda diffinio amcanion clir: roedd angen i'r sied fod yn

gryno, yn gallu gwrthsefyll y tywydd, yn addasadwy ac yn ddiogel, tra'n cynnig ystod o fewnbynnau synhwyrdd i ddarparu ar gyfer dewisiadau amrywiol defnyddwyr.

Dewiswyd lleoliad tawel, traffig isel ar gyfer gosod y prototeip i leihau gwrthdyniadau allanol. Rhoddwyd blaenoriaeth i hygyrchedd gyda nodweddion megis drws mynediad llydan sy'n addas ar gyfer mynediad i gadeiriau olwyn.

Sleid 12

Y tu mewn, roedd y gofod wedi'i drefnu i ganiatáu rhyddid i symud ac i gynnal gweithgareddau synhwyrdd ar eistedd ac ar y llawr. Roedd y tu mewn i'r sied yn cynnwys amrywiaeth o nodweddion synhwyrdd. Ar gyfer ysgogiad cyffyrddol, gosodwyd paneli wal gweadog, biniau synhwyrdd, a rygiau meddal. Roedd elfennau gweledol yn cynnwys goleuadau LED addasadwy, delweddau taflunio ysgafn, a chynllun lliw niwtral i osgoi gorsymbylu. Darparwyd mewnbynnau clywedol trwy beiriannau sŵn gwyn a cherddoriaeth feddal, tra bod tryledwyr olew hanfodol lleddfol yn cynnig arogleuol ysgafn. Roedd seddau cyfforddus fel bagiau ffa, matiau llawr, a blancedi wedi'u pwysoli yn helpu i gefnogi'r sylfaen ac ymlacio.

Roedd dewis enw teitl Cymraeg ar gyfer y sied synhwyrdd yn gam pwysig i adlewyrchu'r diwylliant lleol a meithrin ymdeimlad o gysylltiad a hunaniaeth. Roedd angen i'r enw fod yn ystyrlon, ac ennyn ymdeimlad o archwilio tawel neu synhwyrdd.

Sleid 13

Ystafell synhwyrdd yw un o'r dewisiadau mwyaf cyffredin yn lle sied synhwyrdd. Wedi'u lleoli fel arfer dan do mewn ysgolion, clinigau, neu ganolfannau therapi, mae ystafelloedd synhwyrdd yn cynnwys gwahanol oleuadau, gweadau, synau, ac offer arbenigol sy'n helpu unigolion i ymgysylltu â'u synhwyrdd neu eu tawelu. Mae'r ystafelloedd hyn yn hynod addasadwy a gellir eu haddasu ar gyfer symbyliad ac ymlacio, yn dibynnu ar anghenion y defnyddiwr. (Sensory Room Planner, 2025)

Cysyniad tebyg arall yw'r gornel dawel. Mannau llai yw'r rhain sydd wedi'u cerfio o fewn ystafelloedd dosbarth, cartrefi, neu ganolfannau cymunedol, gan ddarparu man tawel i unigolion hunanreoleiddio a chymryd egwyl synhwyrdd. Er eu bod yn aml yn llai ymdrochol na sied synhwyrdd lawn, maent yn hawdd eu gweithredu ac yn effeithiol ar gyfer ailosodiadau emosiynol cyflym.

Mae gerddi synhwyrdd awyr agored hefyd yn rhannu pwrpas tebyg, gan ddefnyddio elfennau naturiol i ddarparu profiadau therapiwtig. Mae'r gerddi hyn yn ymgorffori planhigion, blodau persawrus, clychau gwynt, a nodweddion dŵr i ymgysylltu â synhwyrdd lluosog mewn amgylchedd tawel, seiliedig ar natur. Maent yn cynnig math gwahanol o fewnbwn synhwyrdd ac yn arbennig o effeithiol ar gyfer unigolion sy'n elwa o fod yn yr awyr agored.

Sleid 14

Cynlluniwyd y sied synhwyrdd i gynnig gofod preifat, cynhwysol, sy'n gysylltiedig â natur sy'n cefnogi unigolion ag ystod eang o anghenion synhwyrdd neu emosiynol. Er ei fod yn darparu preifatrwydd llawn, nid oedd y strwythur yn ynysu defnyddwyr yn gyfan gwbl o'r awyr agored; yn hytrach, roedd yn cofleidio'r amgylchedd naturiol trwy nodweddion fel ffenestr do, golau naturiol meddal, a phlanhigion a choed o'i amgylch. Fe wnaeth ffens helyg a rhannwr wedi'i drefnu'n feddylgar helpu i gynnal ymdeimlad o neilltuaeth wrth ymdoddi i leoliad yr ardd.

Roedd goleuadau newidiol mewn lliw yn caniatáu i naws y gofod gael ei addasu yn unol â dewisiadau personol neu nodau therapiwtig, tra bod tu mewn meddal - gan gynnwys clustogau a gwadau tawelu - yn gwella cysur corfforol. Roedd llenni yn cynnig hyblygrwydd ychwanegol ar gyfer preifatrwydd a rheolaeth golau. Roedd y sied yn gwbl hygyrch i gadeiriau olwyn ac yn agor yn syth i ardd breifat, a oedd yn cynnwys elfennau synhwyrdd fel pwll tywod, arwynebau cyffyrddol, a gwyrddni rhyngweithiol. Gyda'i gilydd, creodd y nodweddion hyn hafan ddiogel, addasadwy ar gyfer myfyrio, rheoleiddio ac archwilio synhwyrdd.

Sleid 15

Roedd bwrdd gwybodaeth wedi'i osod y tu ôl i brototeip y sied yn ffordd effeithiol o hysbysu ymwelwyr am bwrpas, nodweddion a manteision y sied. Roedd yn cyfleu'r bwriad y tu ôl i'r dyluniad gan amlygu sut roedd y gofod yn cefnogi unigolion ag anghenion. Roedd y bwrdd yn cynnwys disgrifiadau o nodweddion allweddol, ac esboniadau o sut roedd yr elfennau hynny'n hyrwyddo lles a rheolaeth synhwyrdd.

Test stage and feed back

Conducting a test stage for our design was extremely beneficial, receiving feedback from the test stage that agreed with evidence we have found, suggested that we are going in the right direction with our idea.

Some suggestions that we received for our design from this test stage were things such as to include some scented plants outside the shed. We thought the best option of plants to have would be different types of herbs. This is due to the fact that the smell from herbs is more voluntary and depends on interaction with the plants.

Implementation

While a lot of schools have started introducing similar ideas, sensory rooms and quiet corners, we have taken it a step further to keep outdoor learning as outdoor learning, especially for neurodiverse individuals. Indoor sensory areas may be easier to

implement, however, is it very important, especially in an ever-increasing indoor world, to encourage outdoor learning for all.

Implementing a sensory shed can be broken down into 5 key steps:

Assess need – consult SENCOs, staff members, parents and students

Design the space – consider accessibility, safety, and multi-sensory elements.

- while there may be a main framework for what is in a sensory shed, each school may want something different to the next, to be able to meet the needs of their neurodiverse student population

Secure funding – use PTA support, grants, or local council initiatives

- Host fundraising events, advertise in local communities

Train staff – provide CPD on sensory needs and emotional regulation strategies.

- Training for staff to be able to understand the needs of their neurodiverse students and implement strategies to help them the best they can is an important part of making the students seen and heard

Evaluate Impact – track student use and behavioural/academic changes

Conclusion

To conclude, our project began with a simple question: how can we support neurodiverse children facing sensory challenges in outdoor education? Through the design thinking process, we developed not just a theoretical answer, but a practical, inclusive solution – our prototype for an outdoor sensory shed.

This shed reflects empathy, user-centred design, and an understanding that meaningful inclusion requires more than good intentions – it requires environments tailored to real needs, taking into account the different textures, lighting, and noise requirements of different neurodiverse people, remembering everyone is not the same.

We explored the sensory barriers neurodiverse children face, especially in overstimulating or unpredictable settings. Our design offers a calming adaptable space that provides comfort, privacy, and regulation – all while making sure not to isolate individuals from the outdoors and natural world. Feedback from our testing stage reinforced the potential impact of our idea, and the implementation plan demonstrates how this concept could be brought to life in real educational settings.

Ultimately, our sensory shed is more than a physical structure, it represents a commitment to educational equity, emotional well-being, and giving every child the tools and space they need to thrive.

Individual experiences

- Holly

I was surprised by how many ideas and concepts design thinking allowed us to explore, even with only three peoples worth of experience and ideas. Furthermore, I found it to be very helpful how following the sequence of design thinking kept us very focused and aware of our goals throughout the process of creating our prototype.

- Megan

I was able to use my experience within classrooms of many sizes and capabilities to bring our idea to life. I liked that we had multiple opportunities to show our prototype to a range of people with different backgrounds that allowed us to add to our prototype to improve any mistakes or anything we had missed out.

- Izzie

From my own personal experience of being neurodiverse, being part of an idea like this

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