A.P.T. CONFERENCE 2015, FLIPPING THE CLASSROOM

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Maritime Centre,
University of Greenwich,
Greenwich,
London, UK

A GROUNDED THEORY DESIGN AND IMPLEMENTATION OF A COURSE TO SUPPORT STUDENTS WITH DISABILITIES USING TABLET COMPUTERS AND SMARTPHONES AT THE LONDON SCHOOL OF ECONOMICS AND CANTERBURY CHRIST CHURCH UNIVERSITY, UK

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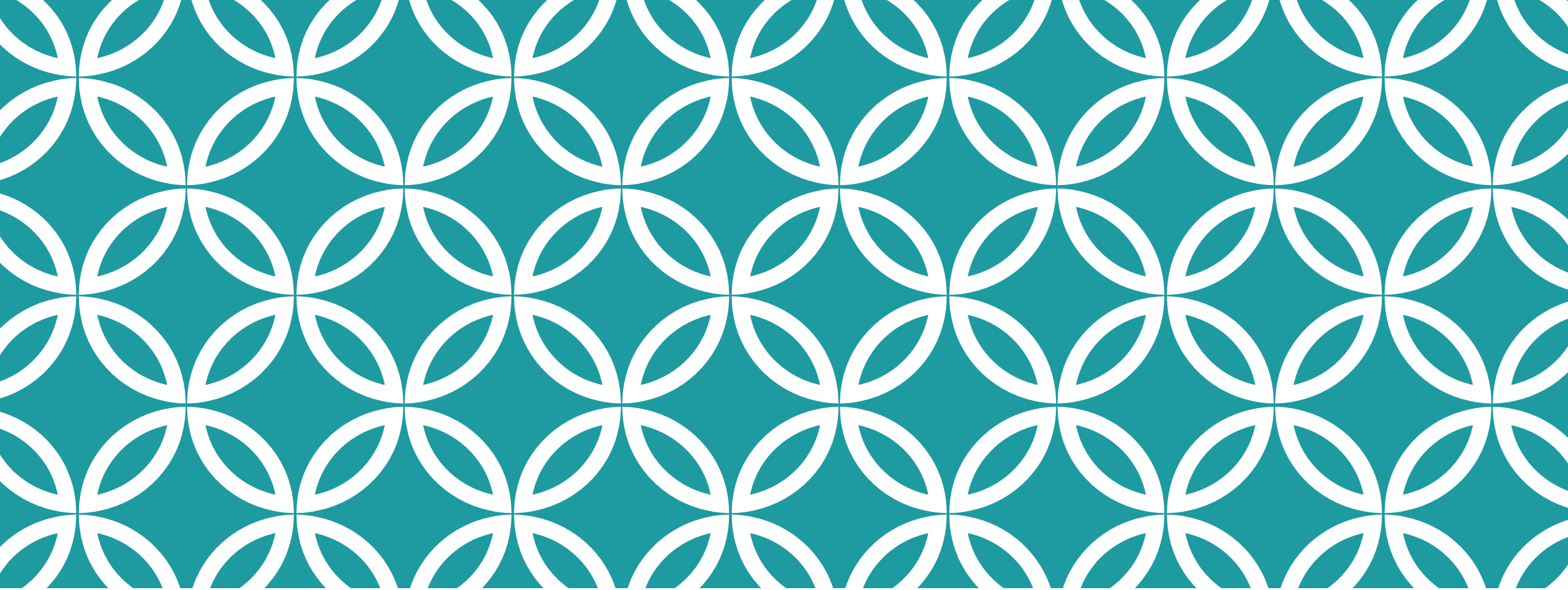


INTRODUCTION

The reason for the study, aims and objectives

THE MOTIVATION FOR THE STUDY

The Disabled Students Allowance (DSA) is a government grant for students aged 18 years and over in English and Welsh higher education

Amongst other things, this grant supports the provision of traditional assistive technologies

In April 2014, the British Minister for Universities and Science proposed cuts to the DSA

Although a later announcement has suggested that these cuts will be postponed until the academic year 2016-2017, a number of universities are already preparing alternative means to support disabled students in future

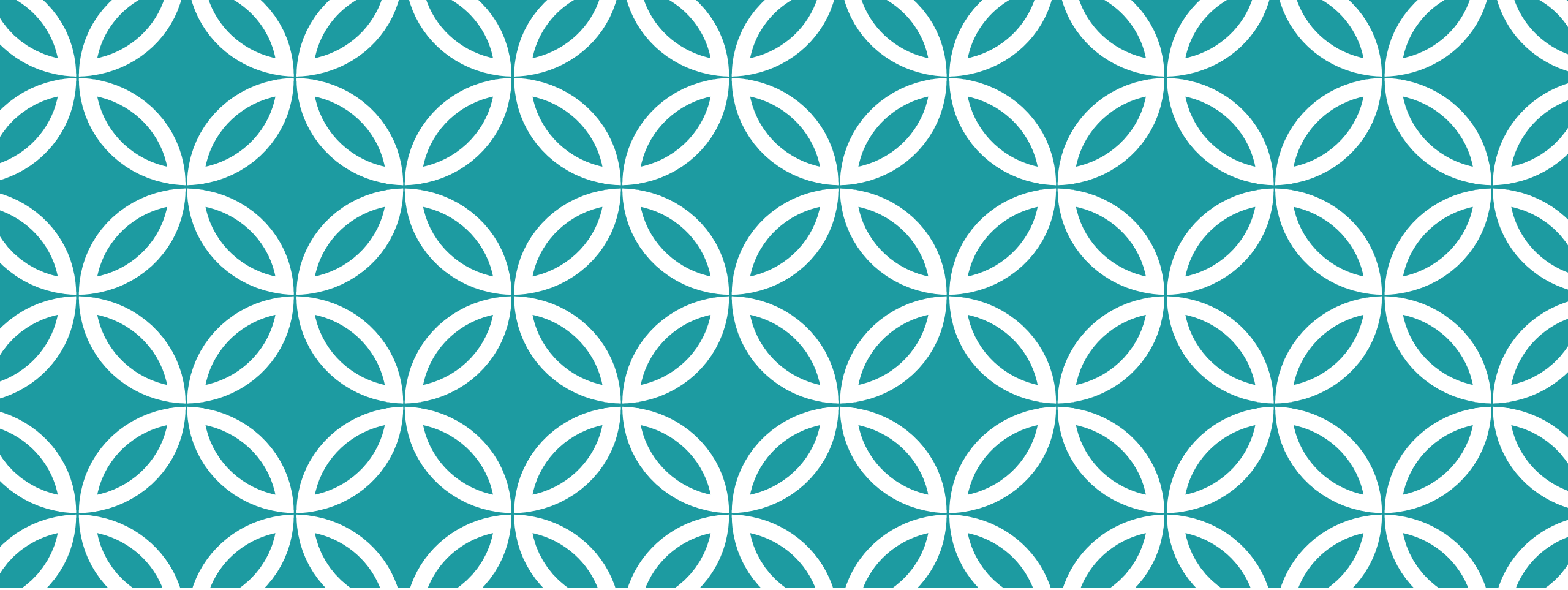
AIMS & OBJECTIVES OF THE STUDY

Investigate a cost effective alternative to traditional, expensive assistive technologies

Develop education and training on the use of mainstream technologies that students largely own anyway and use for alternative purposes

Evaluate whether students are already using these devices, and how to employ them to best effect

Explore the most effective way of providing training in the use of these devices



CONTEXT OF THE STUDY

Literature and policies that provide context to the study

DEFINITION OF DISABILITY (2010 EQUALITIES ACT)

"You're disabled under the Equality Act 2010… if you have a physical or mental impairment that has a 'substantial' and 'long--term' negative effect on your ability to do normal daily activities.

<u>What substantial and long-term mean</u>

'substantial' is more than minor or trivial – eg it takes much longer than it usually would to complete a daily task like getting dressed

'long-term' means 12 months or more- eg a breathing condition that develops as a result of a lung infection" (HM Government, 2014: 0nline)

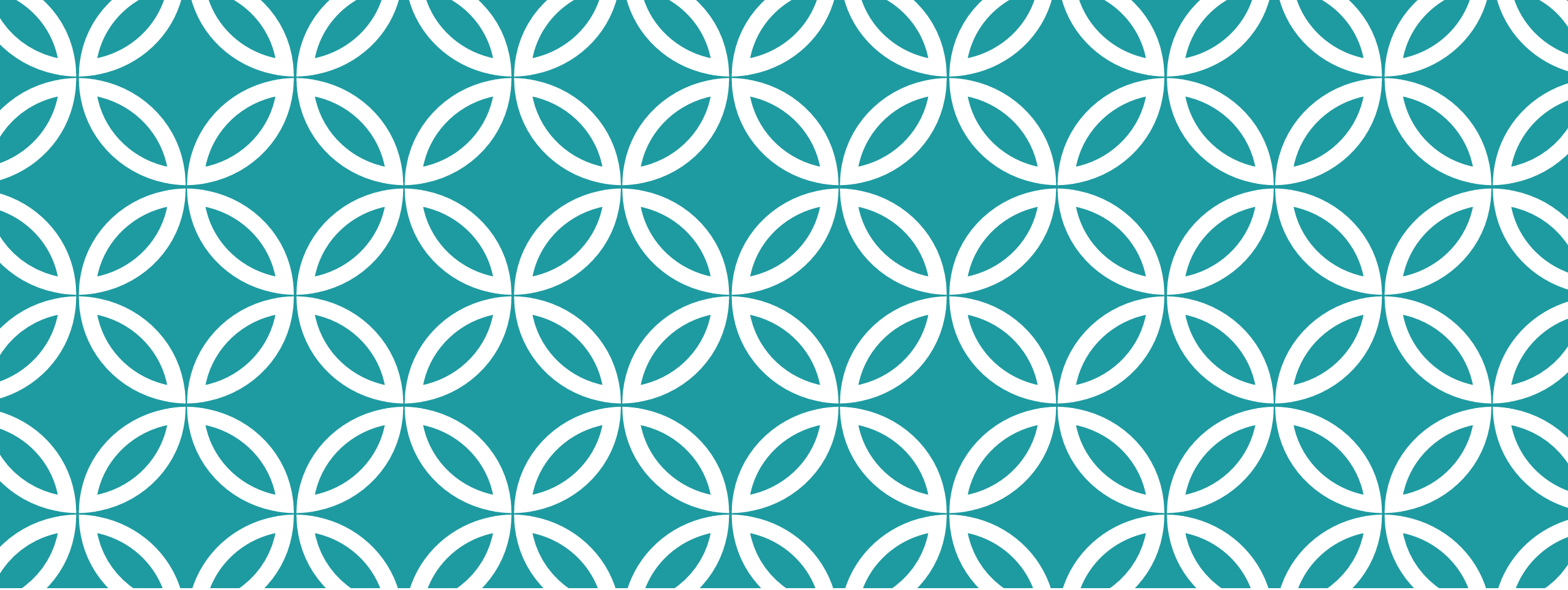
DEFINITIONS AND TECHNOLOGY

Accessible technology:

- "Any item, piece of equipment, or system, whether acquired commercially, modified, or customized, that is commonly used to increase, maintain, or improve functional capabilities of individuals with disabilities." (Architectural and Transportation Barriers Compliance Board, 2000 : P. 80504)

Inclusive technology:

- Mainstream technology that can be used with either no or minimal adaption by a person with a disability as an accessible technology. It is also seen as technology that provides social inclusion, such as communication and interaction, for people with disabilities (Hayhoe, 2013, 2014a)



METHODOLOGY OF STUDY & DESIGN

A Grounded Methodology approach

METHODOLOGY

The methodology employed for the design and evaluation of the course was a development of Grounded Theory (Glaser & Strauss, 1967)

The adaptation was a grounded methodology, in which the technical elements of the methodology is refined and employed for an ongoing process – either for analysis, design or activity (Hayhoe, 2012)

This is a methodology in which all information, literature and theory can be regarded as data

Methodology in which hypothesis and theories are artificially induced

The core of the methodology uses three phases of study, through which data is analysed to a point at which a hypothesis can be formed, and then selectively test

The analysis is cyclical, as the selective testing of the hypothesis feeds into the initial stage of a next study

TREATING DATA LIKE WRITING AN EVERLASTING PLAY (HAYHOE, 2012)

Open coding is like choosing the characters and main events in your play.

Axial coding is like choosing your plot, and examining how the story evolves.

Selective coding is like choosing the story lines that put the plots and sub-plots together.

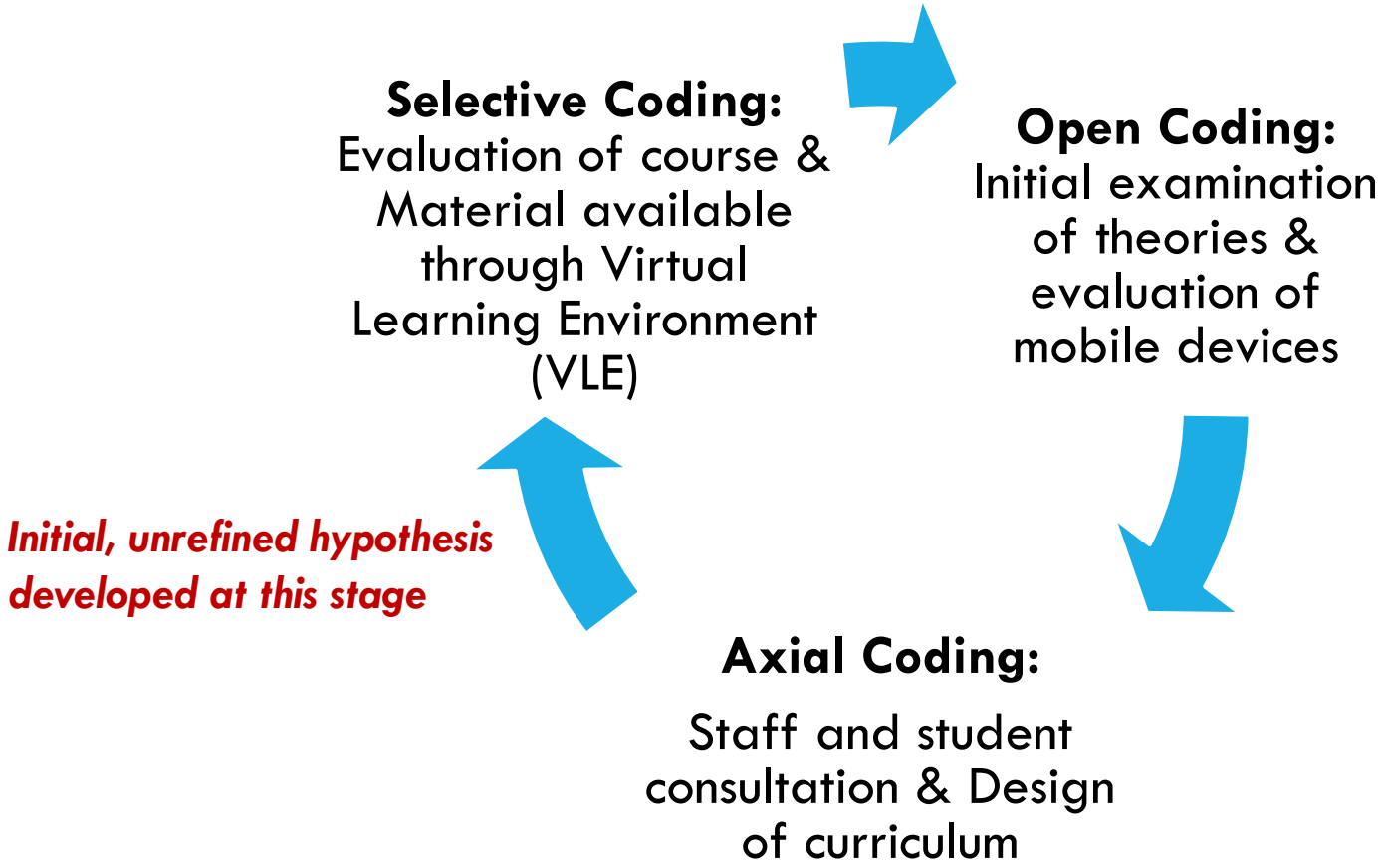
SAMPLING PEOPLE AND PHENOMENA AS CASTING AND WRITING A PLAY

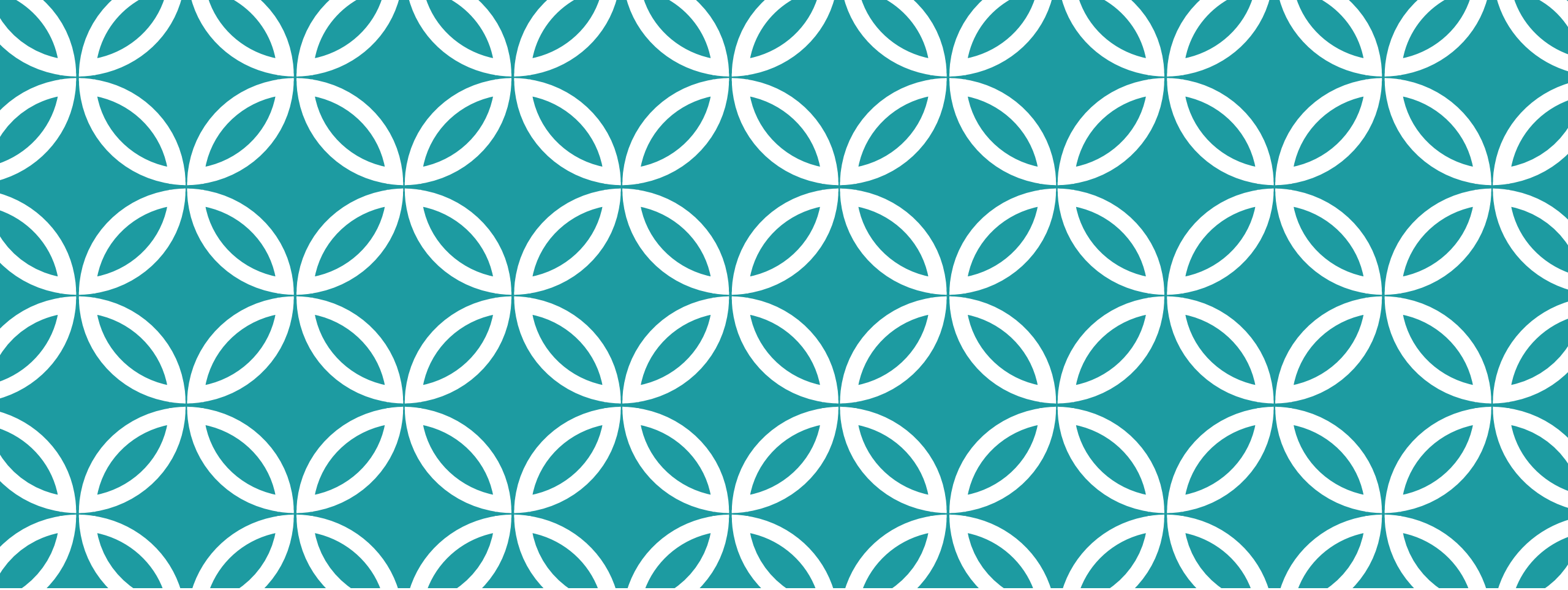
Initial data gathering for Open coding involves trying to select a representative sample of subjects and their situations.

Axial coding is finding representative subjects and researching their plots in detail.

Selective coding involves researching a select sample according to their interactions with other actors and plots to analyse the stories that are being told in the play.

GROUNDED THEORY CYCLE OF ANALYSIS





OPEN CODING

Initial pilot phase of study

OPEN CODING

Theories of inclusion and technology were investigated

Research studies of the implementation of tablets of smartphones were analysed in the context of support for disabled students in higher educational institutions

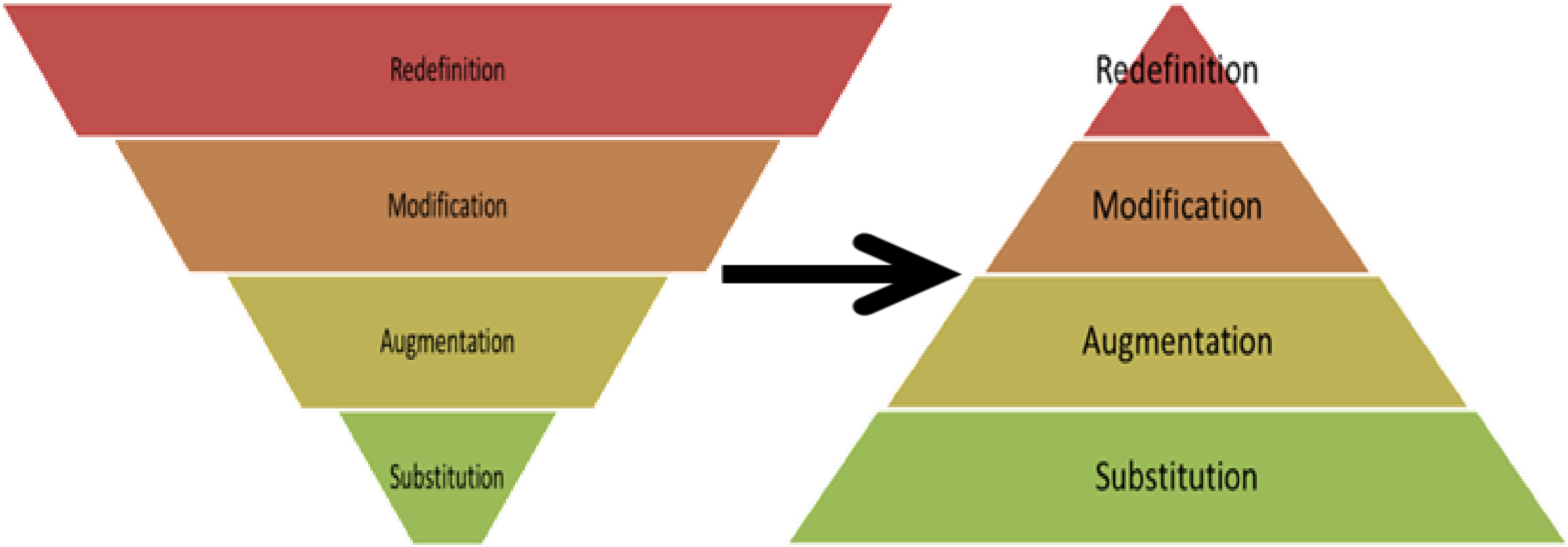
Native apps in two mobile operating systems - Android and Apple iOS - were evaluated

- model of ITC
- model of SAMR

THE SAMR EDUCATIONAL TECHNOLOGY MODEL (HAYHOE, 2014A)

TRANSFORMATION		
Redefinition	Technology prompting the training of new skills	Customised technology that allows students to write or read using alternative technologies, such as the Perkins Brailer
Modification	Technology prompting the significant redesign of tasks	Customised technology that allows teachers and students mobility, writing facilities, reading facilities, hearing facilities
Augmentation	Technology mirrors an existing tool, with functional improvements	Accessible settings, such as voice recognition
Substitution	Technology acts as a replacement, with no functional change	Tablet computers, smart phones, mp3 players and multimedia devices with differing inputs and outputs
ENHANCEMENT		

SAMR PYRAMID OF INCLUSION (HAYHOE, 2014A)



Traditional Separate Assistive Technology

Inclusive Technology

BOURDIEU & CAPITALS

Bourdieu (2010) argues distinction in life chances through capitals, e.g.

- social, cultural and financial capitals.

Habitus:

- "Principles which generate and organise practices." (Bourdieu, 1990: P.53)

Field = knowledge and behaviour that teaches distinction [(habitus)(capital)] + field = practice (Bourdieu, 2010: P.95)

MODEL OF TECHNICAL CAPITAL

"[Technical capital is] the availability of technical resources in a network, and the mobilization of these resources in ways that can positively impact access to information and upward mobility." (Yardi. 2010: P.1)

- Yardi's technical capital is related to cultural capital

AN EXAMPLE OF TECHNICAL CAPITAL

E.g. Brock, Kvasny & Hales (2010)

The use of on-line social forums and discussions boards for black women has enabled users to empower themselves by communicating information that would otherwise be unavailable to them

- Therefore, it can be stated:

  [(mainstream habitus)(technical capital)] + mainstream field = inclusive practice

INCLUSIVE TECHNICAL CAPITAL (ITC) MODEL

"Inclusive technical capital can be defined as practice which uses inclusive mainstream technologies to promote inclusion in further forms of social, cultural and financial capitals, through enabled habitus in education and training…

It can thus be argued that inclusive technical capital appears to be more applicable to students' use of new forms of mainstream settings and apps that have been embedded in modern tablet devices and therefore, either purposely or accidentally, lend themselves to redefinition as inclusive technologies." (Hayhoe, 2015a: TBC)

SUMMARY OF FINDINGS OF THE EVALUATION OF APPLE IOS AND ANDROID (HAYHOE, 2015B)

Both systems have relatively similar inclusive accessible settings

Have similar potential for enhancement rather than transformation of tasks

Some settings and functions that make each operating system less useable as tools of technological inclusion

Disabled students, teachers and those that support students with disabilities must evaluate systems according to impairments and educational needs

Both operating systems still need to develop their functions, native apps and usability for students with disabilities

AXIAL CODING PHASE

Staff and student consultations

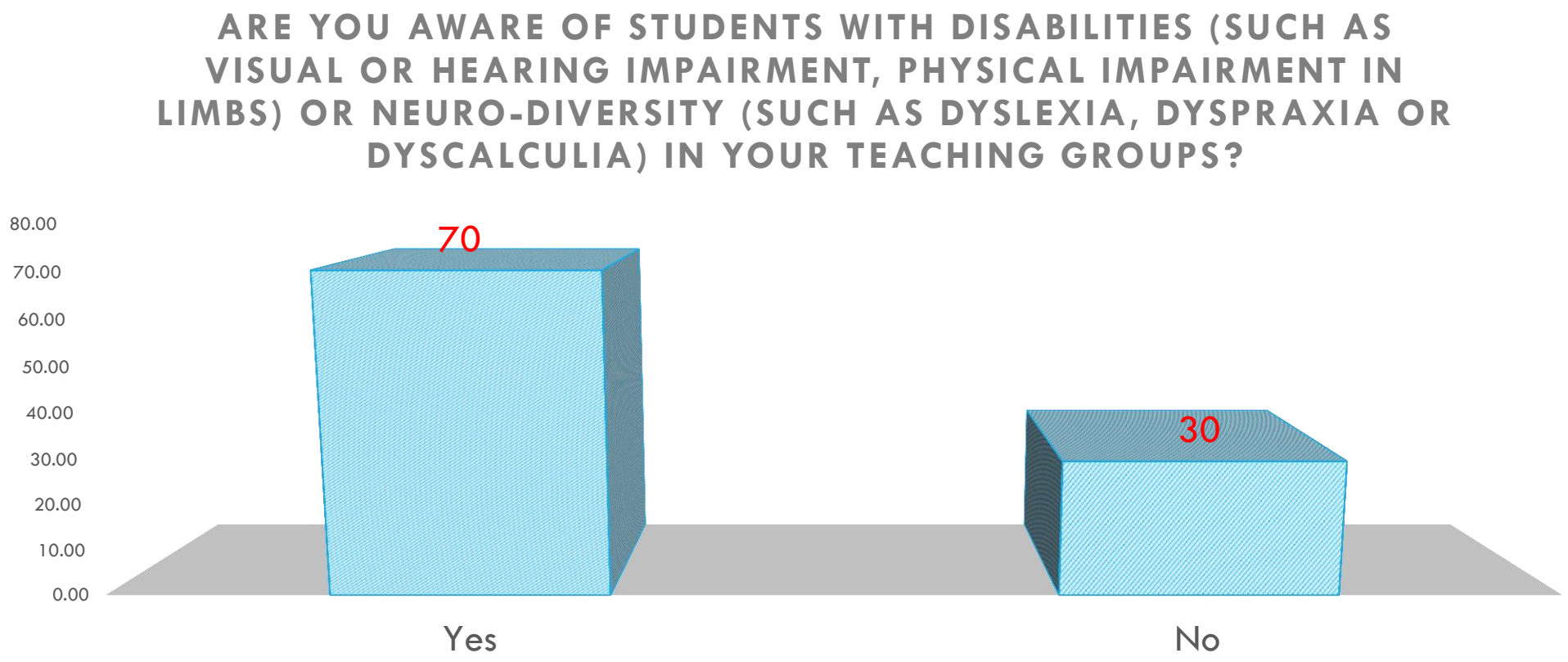
AXIAL CODING

Initial surveys of students (n = 18) and staff (n = 34) stakeholders were produced – this was not statistically significant due to small numbers, but did produce guidelines

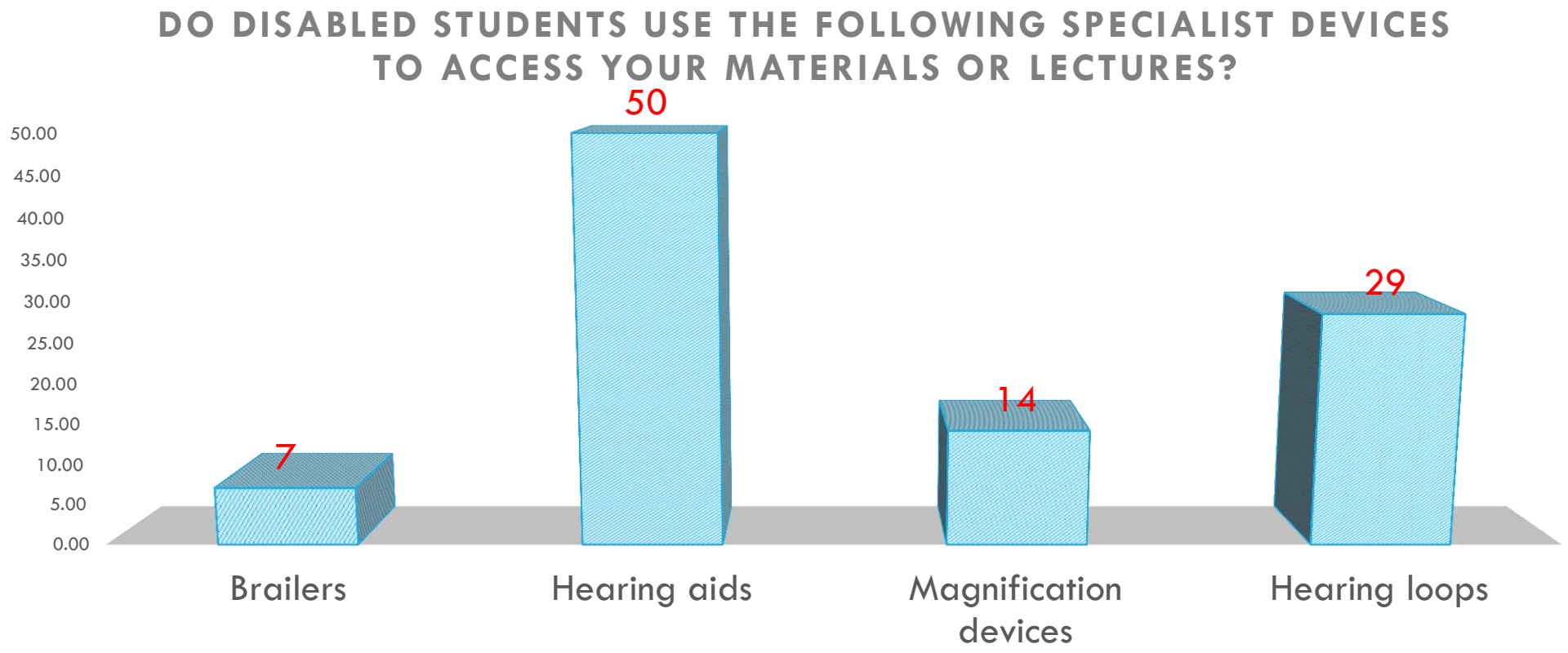
Discussions were conducted between key personnel at the London School of Economics (LSE) and Canterbury Christ Church University (CCCU)

- this included those working with neuro-diverse student, officers involved in the support of learning technologies and officers involved in the use of assistive technologies

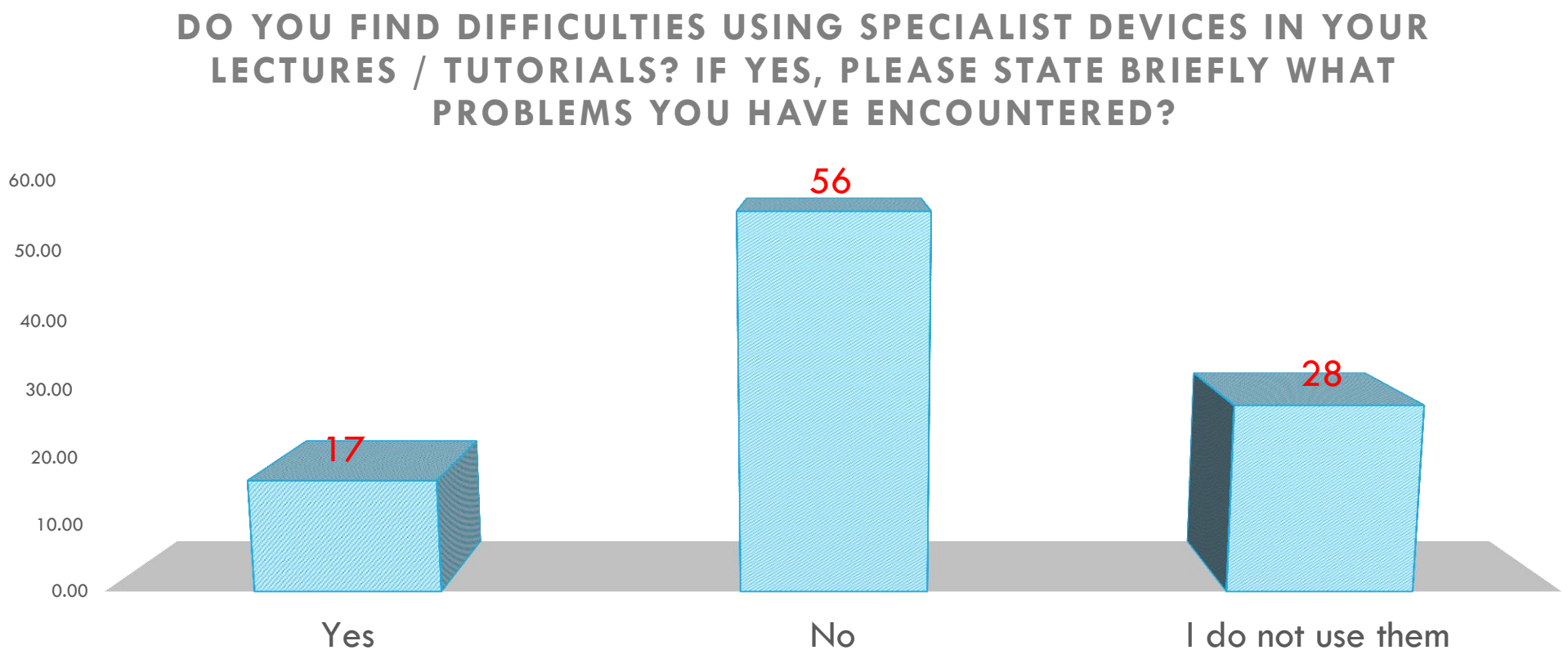
THE MAJORITY OF LECTURERS AND TUTORS WHO EXPRESSED A PREFERENCE KNEW THEY TAUGHT DISABLED STUDENTS



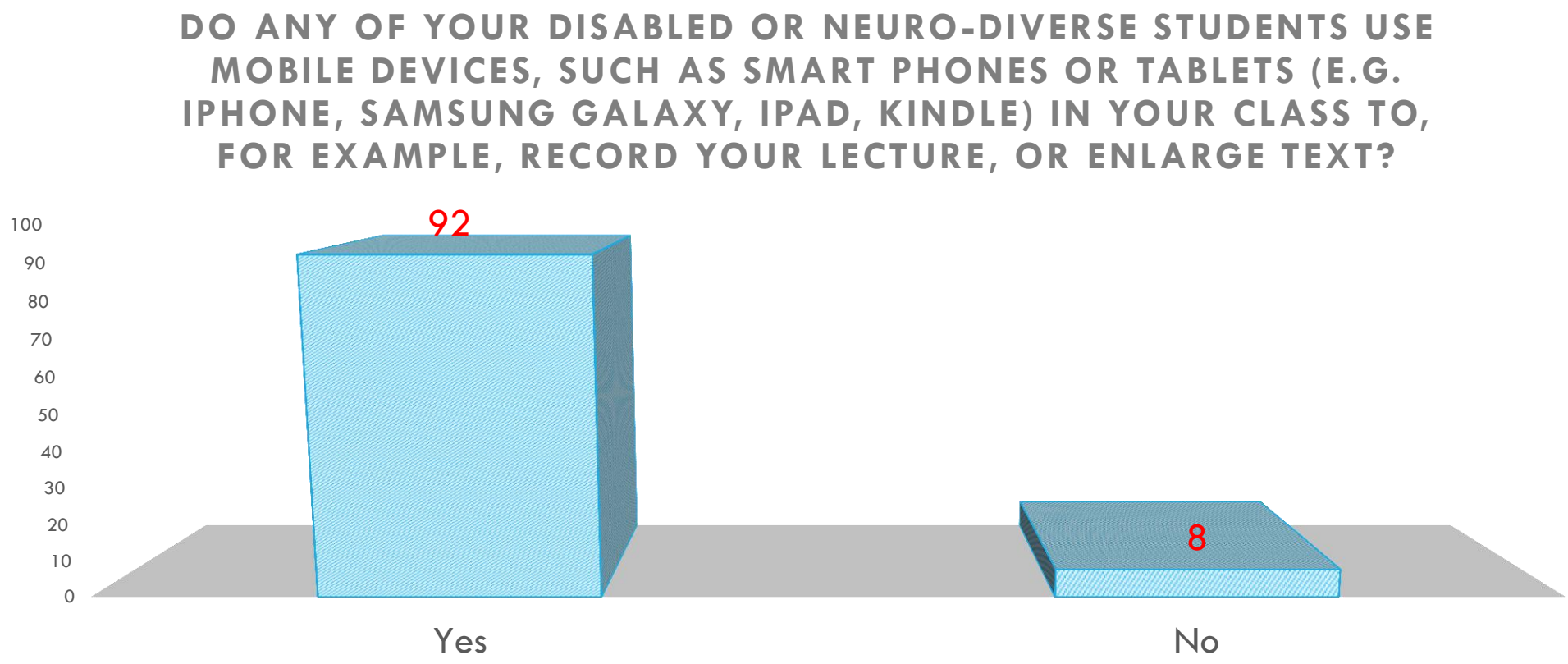
THE MAJORITY OF SPECIALISED DEVICES SEEN BY LECTURERS ARE RELATED TO HEARING IMPAIRMENTS



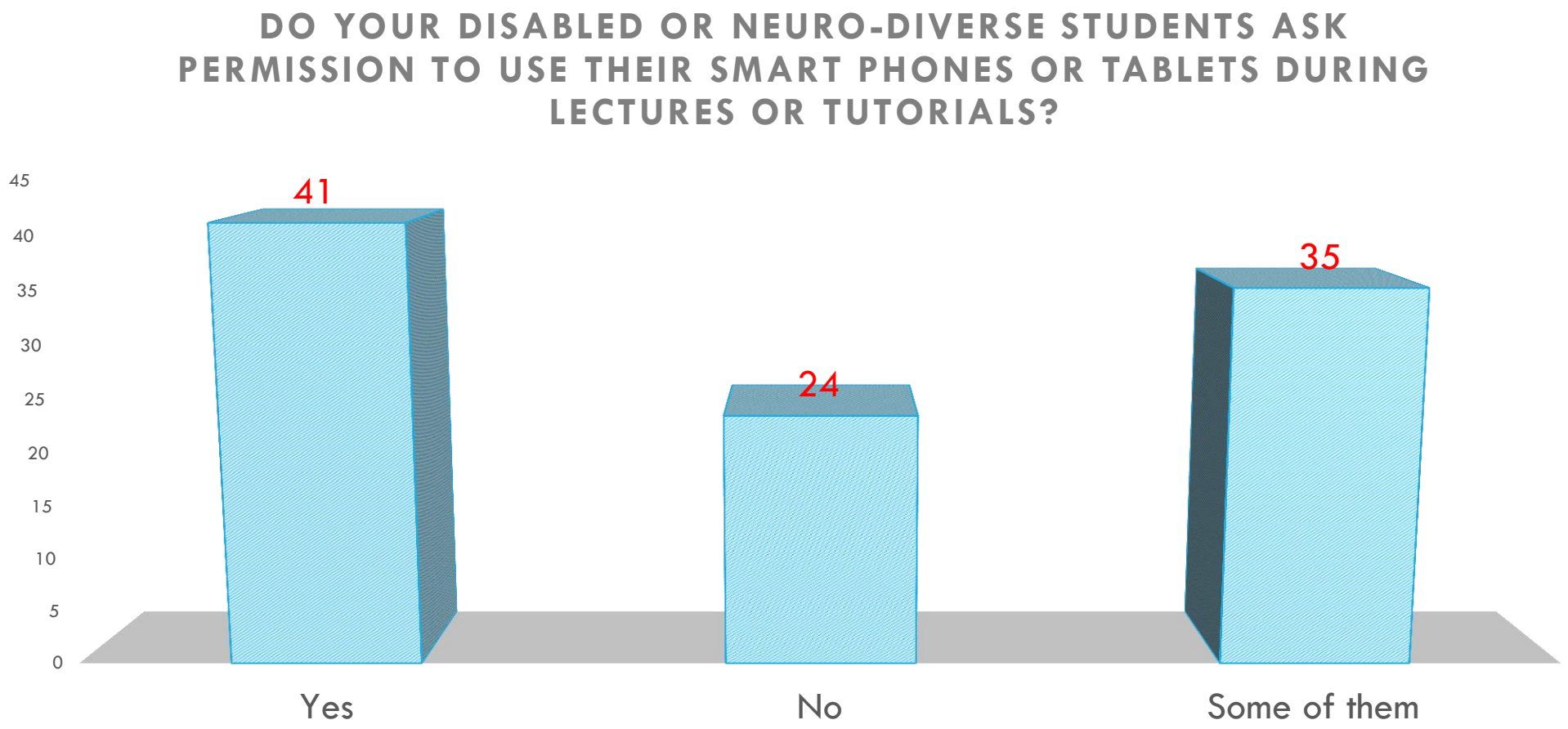
THE MAJORITY OF LECTURERS HAVE NO PROBLEM USING SPECIALIST ASSISTIVE TECHNOLOGIES



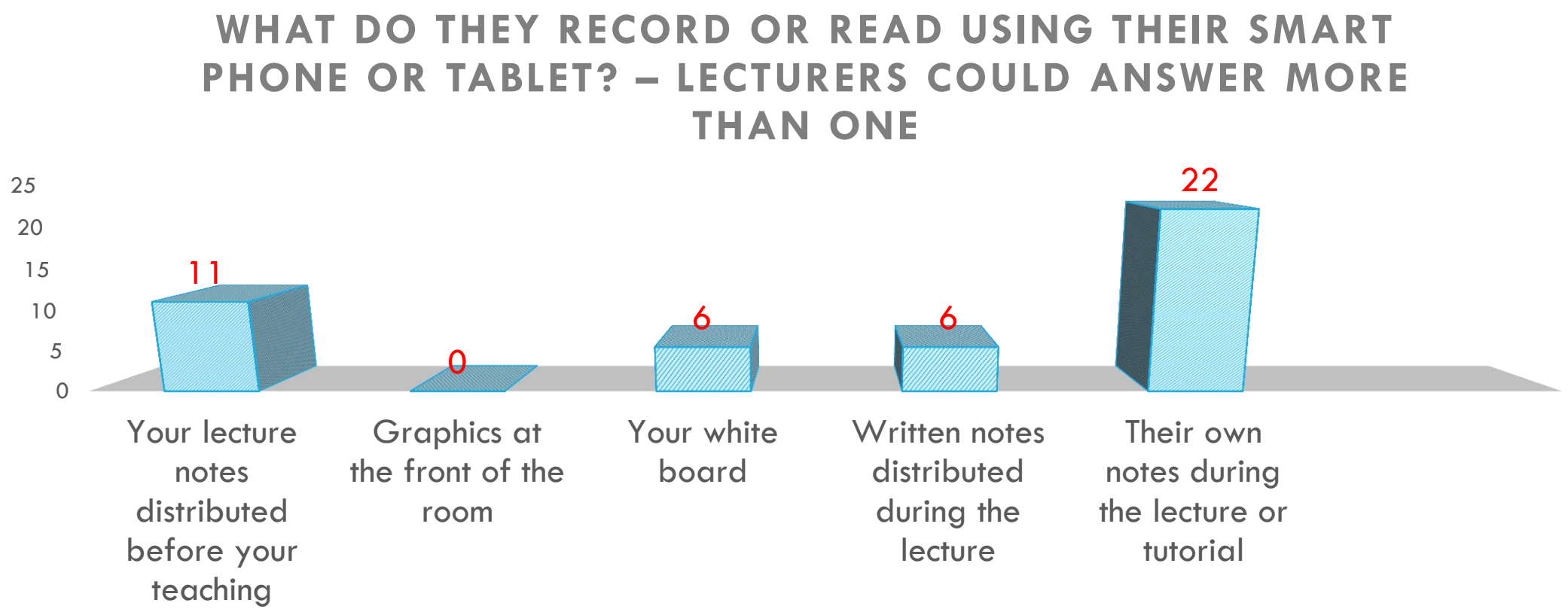
AN OVERWHELMING MAJORITY OF DISABLED STUDENTS USE MOBILE DEVICES



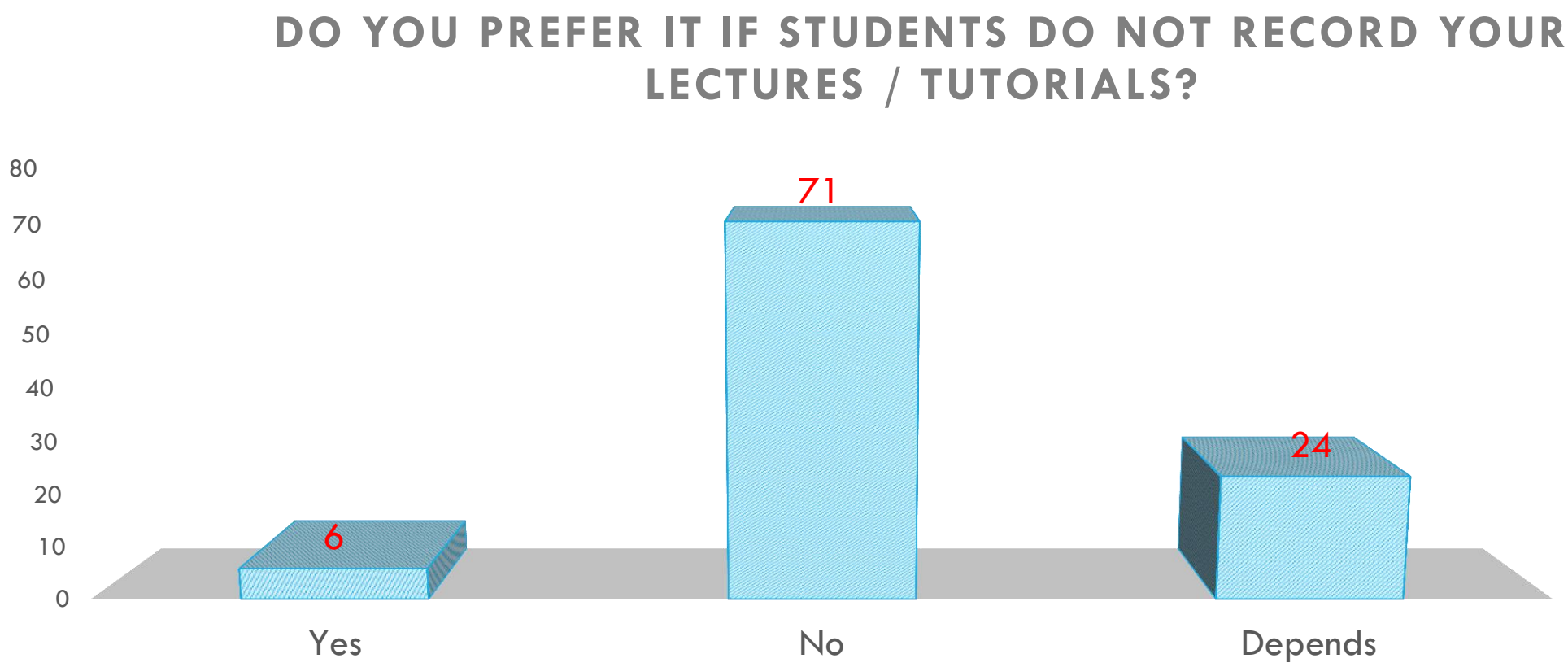
GENERALLY SPEAKING, LECTURERS AND TUTORS WERE ASKED PERMISSION BY STUDENTS TO USE MOBILE DEVICES



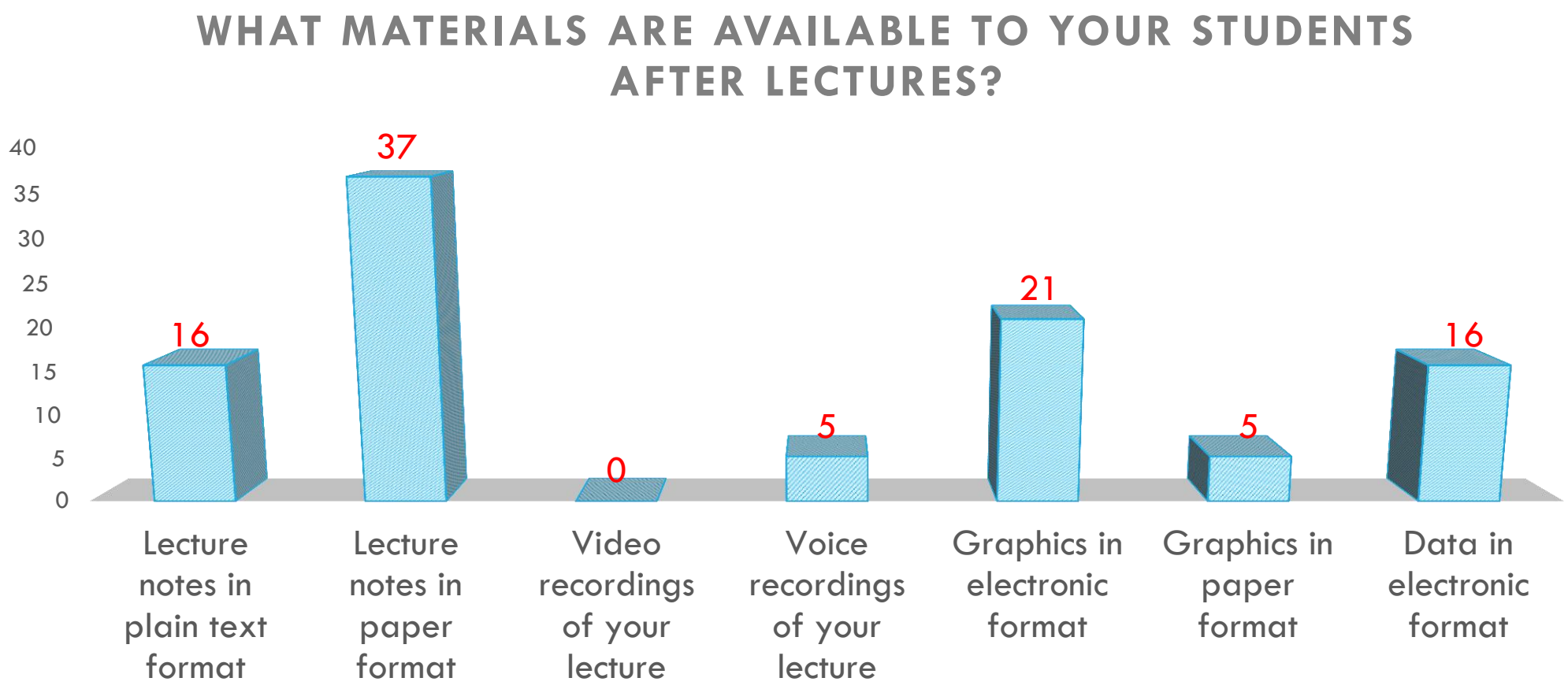
LECTURERS ASSUME MOBILE DEVICES ARE BEING USED TO RECORD STUDENTS' OWN RECORDED NOTES



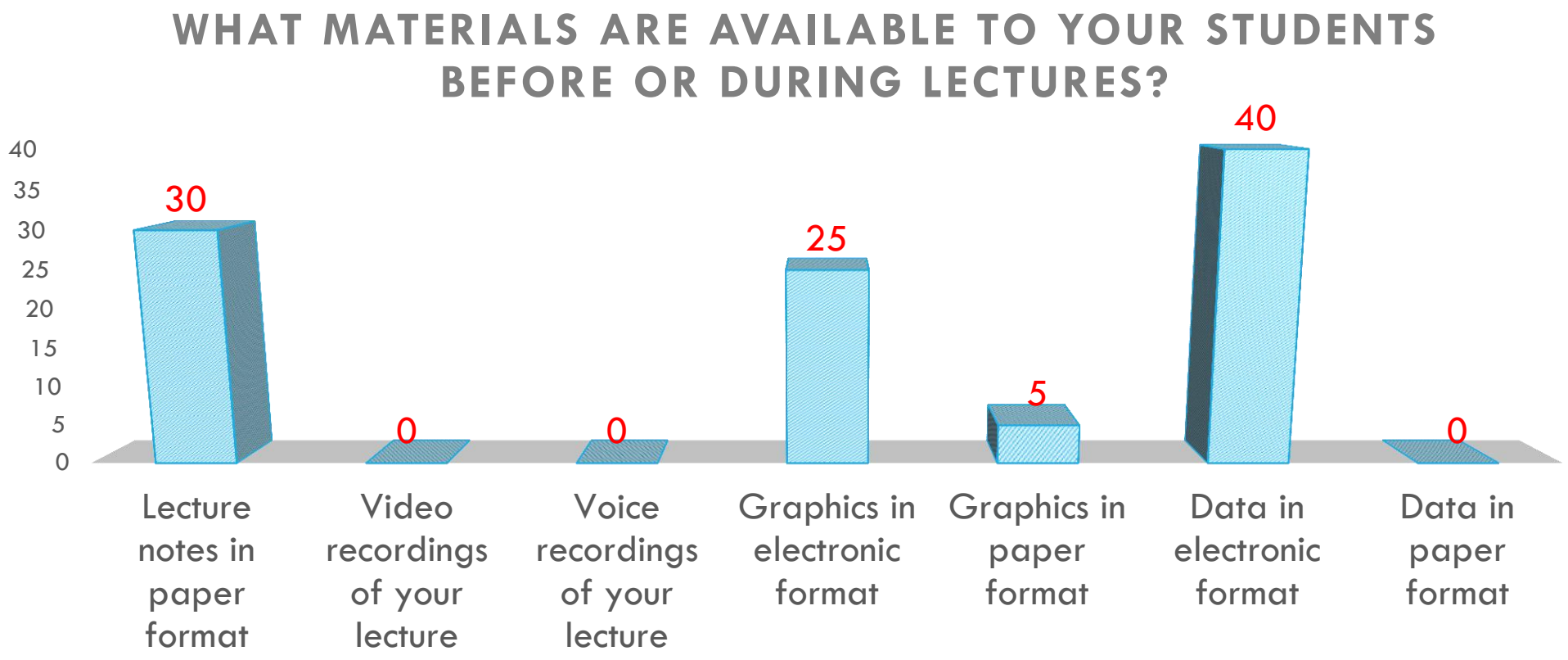
GENERALLY, LECTURERS DO NOT MIND BEING RECORDED BY STUDENTS DURING THEIR LECTURES GIVEN CONTEXT



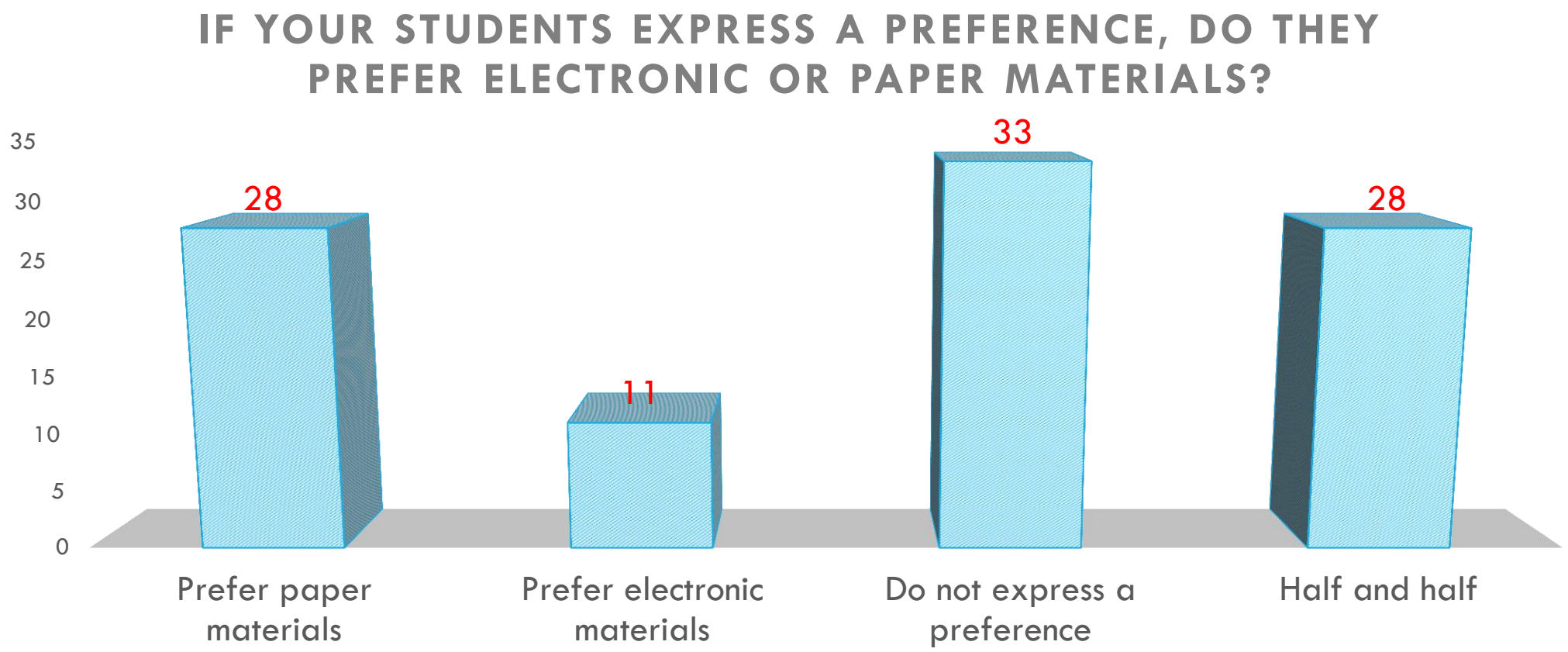
MOSTLY PAPER BASED MATERIALS ARE MADE AVAILABLE AFTER LECTURES, ELECTRONIC MATERIAL LESS SO



LECTURERS MOSTLY MAKE ELECTRONIC MATERIAL AVAILABLE DURING LECTURES, BUT NOT SIGNIFICANTLY SO



GENERALLY THERE IS A PREFERENCE FOR PAPER MATERIAL, ALTHOUGH NOT SIGNIFICANTLY SO



STAFF SURVEY ANALYSIS

Many of the lecturers and tutors were aware of students with disabilities

- Learning difficulties were cited more than physical impairments

Lecturers and tutors are aware of students with disabilities using mobile devices

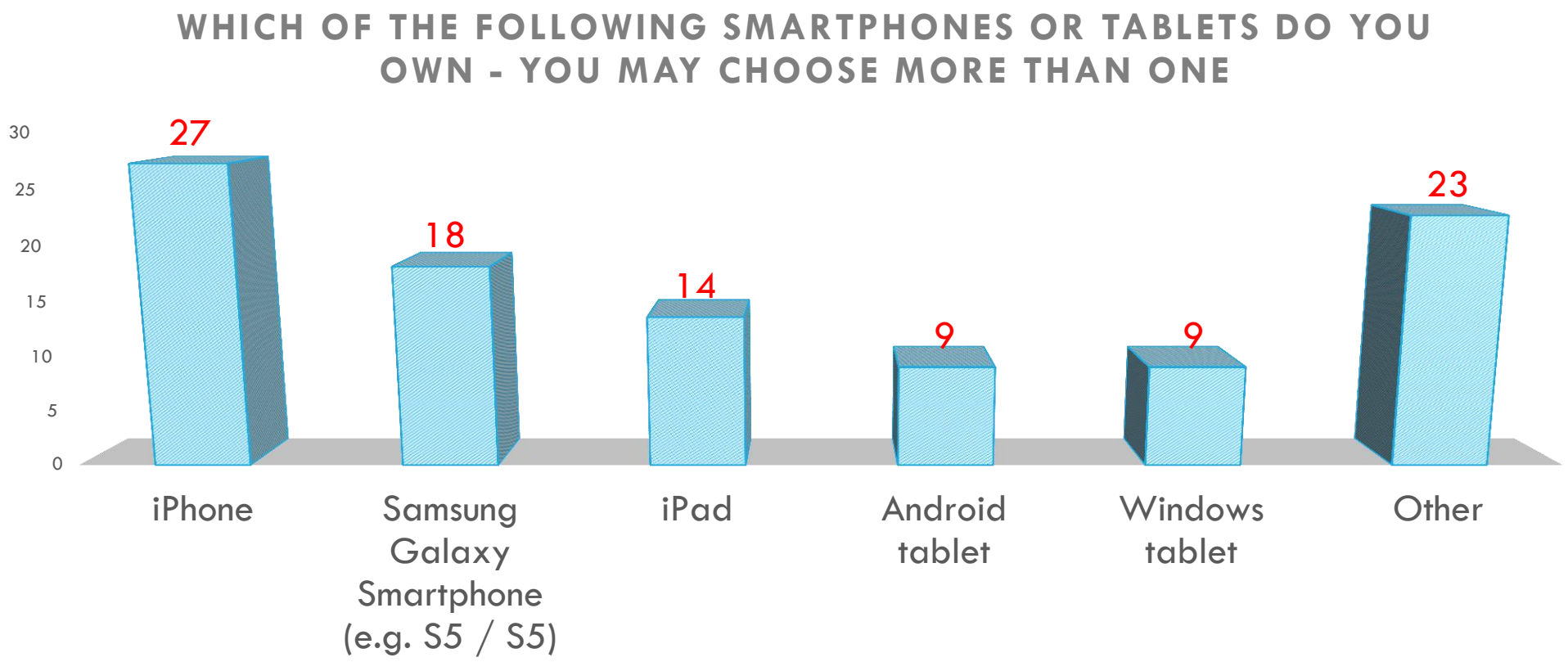
- It was felt that this was not a problem for students to use mobile devices
- These were thought to be more prevalent than specialist assistive technology devices

Lecturers and tutors on the whole did not mind being recorded

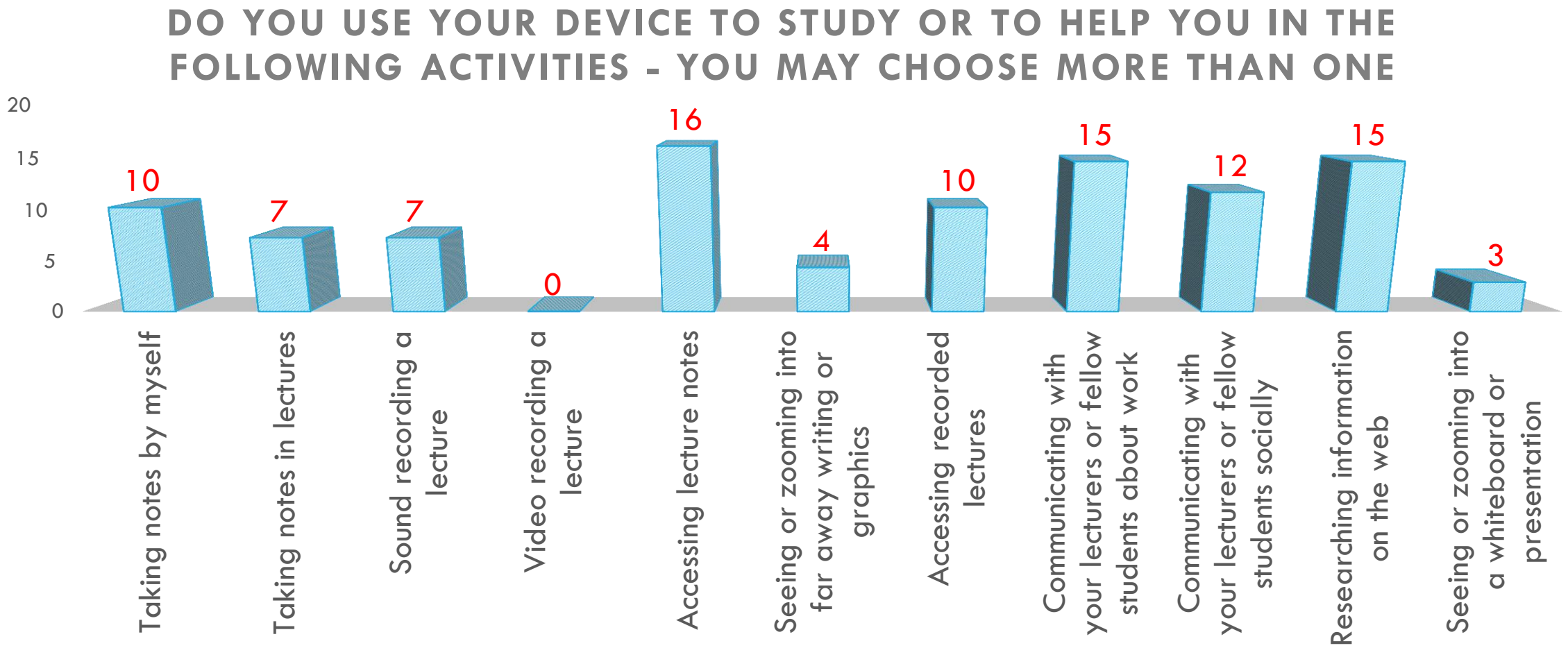
Lecturers distributed paper notes and electronic graphics and data most

Students requested paper notes most, although electronic formats were also requested

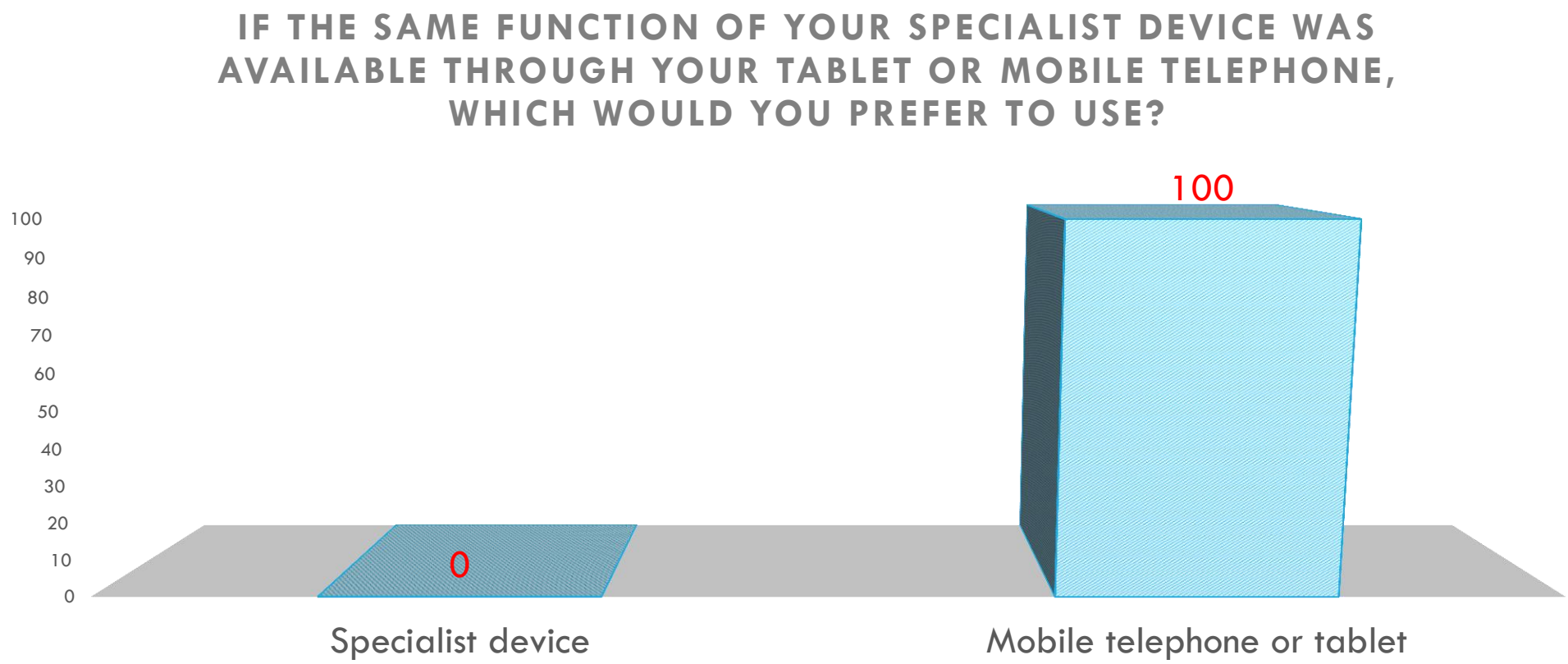
APPLE AND ANDROID DEVICES USED MORE THAN OTHERS



DEVICES MOSTLY USED TO ACCESS, RESEARCH AND COMMUNICATE, AND TO RECORD TO A LESSER EXTENT



ALL STUDENTS WHO EXPRESSED A PREFERENCE SAID THEY PREFERRED MOBILE DEVICES



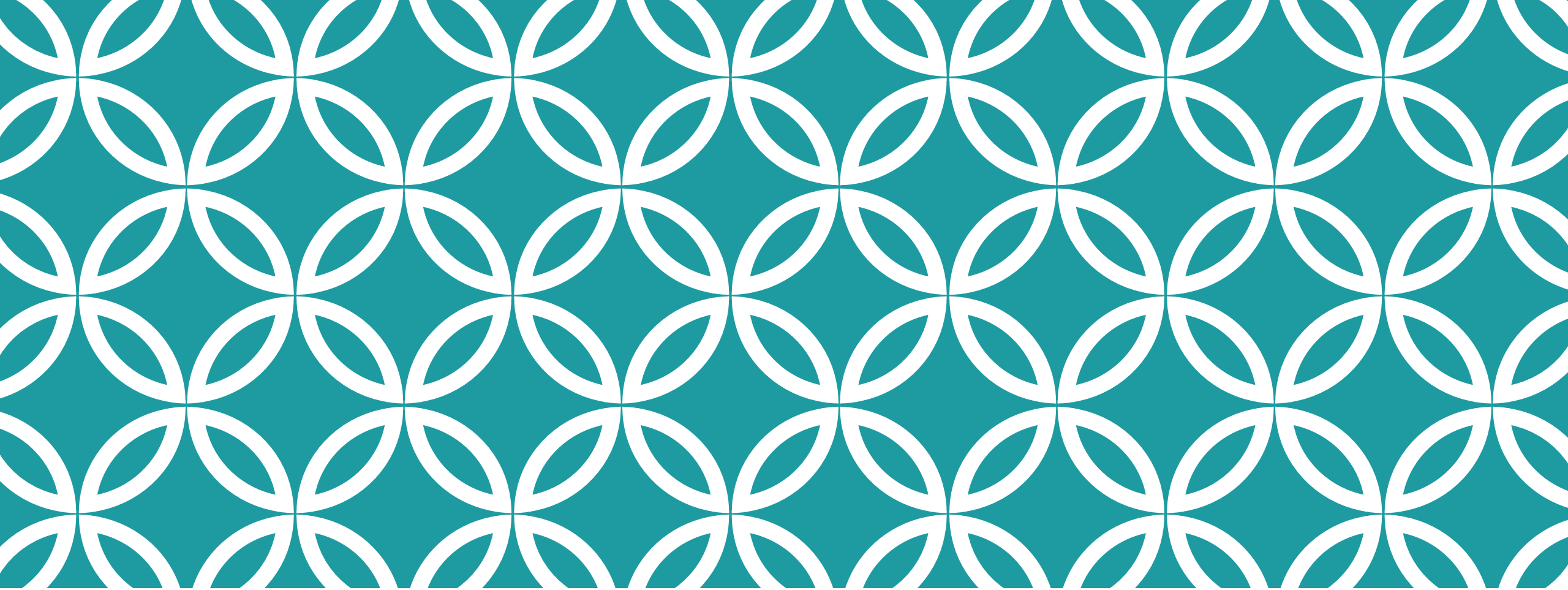
RESULTS OF THE STUDENT SURVEY & DISCUSSIONS WITH RELEVANT STAFF

The initial survey showed that there was motivation to use mobile technologies as inclusive devices by the students and staff who responded

Conversations between officers at the LSE and CCCU working with disabled students and educational technologies suggested that:

Students would like a course based on study skills

That discrete sessions on specific topics would also be beneficial to students in need of support



SELECTIVE CODING

THE HYPOTHESIS FORMED

Students would prefer a model based on three primary study skills – note taking, recording of lectures and mind mapping.

Students would want to attend discrete study skills sessions once every two weeks, during lunch time

Students would want to access materials via a VLE to support their sessions

SELECTIVE CODING

The sessions were run at the LSE and CCCU from October 2014 to January 2015

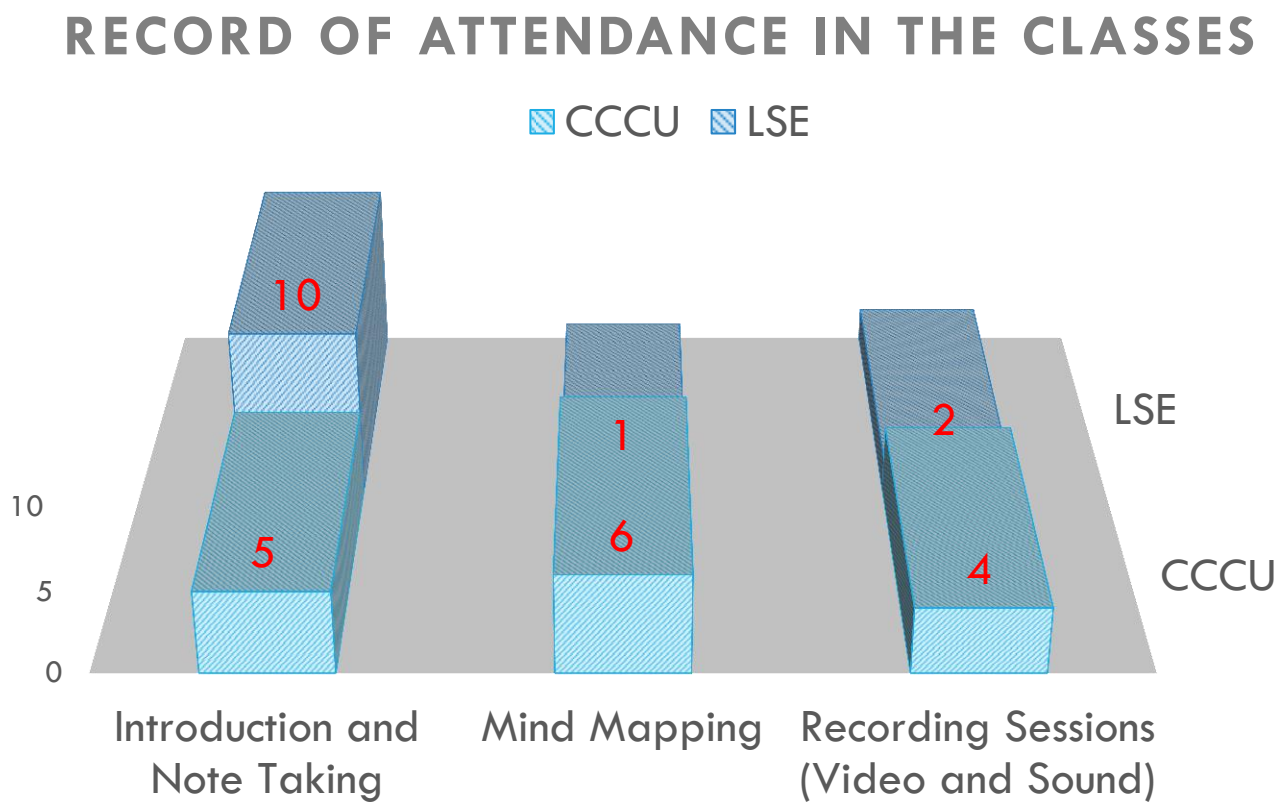
- diaries of the experience were recorded
- an online evaluation of students was conducted

The evaluation of the taught course was limited and provided few results

- Therefore, it was concluded that the survey had little significance

A record of the hits and access dates of the supporting materials on the VLE were recorded

ATTENDANCE OF CLASSES WAS VERY SMALL, AND FLUCTUATED



VLE STATISTICS SHOWED A DIFFERENT PICTURE

Teaching materials, tutorials and videos of the sessions were uploaded on VLE

Number of students registered on the VLE system = 24

All but 2 of the students accessed the material

Materials were accessed well into the new year, after the course and evaluation had finished

Statistics appeared to show that websites on specific apps, and to a lesser extent video recordings of sessions, were popular

PowerPoint tutorials were less popular

BREAK DOWN OF NOTE-TAKING STATISTICS

Note-taking and Sharing Information

Note-taking Session Recording (Echo 360 link)	7	-	Monday, 2 February 2015, 4:47 PM (140 days 4 hours)
Notetaking Apps Roundup	42	-	Tuesday, 3 February 2015, 9:24 AM (139 days 11 hours)
Share your Apps here!	23	-	Monday, 26 January 2015, 9:20 PM (146 days 23 hours)
Additional resources	7	-	Monday, 2 February 2015, 4:49 PM (140 days 4 hours)
Scrivener web site	11	-	Monday, 26 January 2015, 9:23 PM (146 days 23 hours)
Eduroam Guides	8	-	Monday, 10 November 2014, 12:26 PM (224 days 8 hours)
Tutorials on Note Taking	9	-	Monday, 2 February 2015, 4:47 PM (140 days 4 hours)
Tutorials on Accessible Settings	4	-	Monday, 26 January 2015, 9:23 PM (146 days 23 hours)

BREAKDOWN OF MIND-MAPPING STATISTICS

Mind-Mapping

Mind View Website	4	-	Monday, 26 January 2015, 9:52 AM (147 days 11 hours)
iMind Map Website for Tablets	2	-	Monday, 26 January 2015, 9:53 AM (147 days 11 hours)
iMind Map Free Trial Download for a PC	2	-	Saturday, 29 November 2014, 12:24 AM (205 days 20 hours)
iMind Map YouTube Tutorials	1	-	Saturday, 29 November 2014, 12:24 AM (205 days 20 hours)
Mind Mapping Session Recording (Echo 360 link)	3	-	Monday, 2 February 2015, 4:47 PM (140 days 4 hours)
Mind Mapping Tutorials	2	-	Wednesday, 28 January 2015, 12:18 PM (145 days 8 hours)

BREAKDOWN OF RECORDING STATISTICS

Video and Audio Recording Lectures and Seminars

Quick Copyright Tutorial (US Based)	2	-	Tuesday, 2 December 2014, 1:06 PM (202 days 7 hours)
Comprehensive Description of the Data Protection Act	3	-	Monday, 24 November 2014, 10:47 AM (210 days 10 hours)
Echo 360 lecture recording for students	17	-	Monday, 16 March 2015, 8:56 PM (97 days 23 hours)
Lecture and Class Recording - Session Recording (Echo 360 link)	2	-	Monday, 8 December 2014, 11:04 AM (196 days 9 hours)
Videoing, Audio Recording, and Photographing Lectures Tutorial	1	-	Thursday, 15 January 2015, 11:32 AM (158 days 9 hours)
Sharing Files and Google Scholar Tutorial	1	-	Wednesday, 28 January 2015, 12:14 PM (145 days 8 hours)

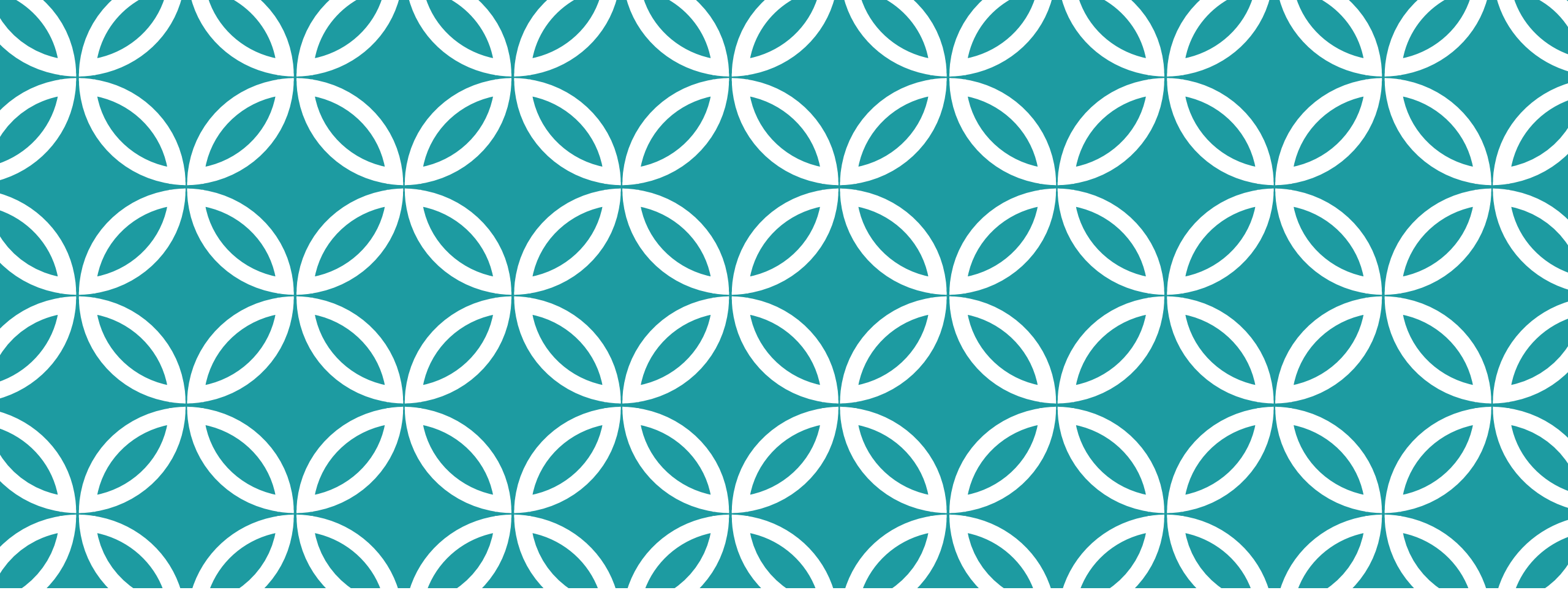
FINDINGS FROM THE SELECTIVE CODING

Students did not attend the sessions in numbers

This meant that there was little impact on the student bodies' use of the technology passed on through face-to-face teaching:

- At the LSE feedback was it was patronising to have a separate course
- At CCCU students said it was difficult to physically attend the sessions

Nevertheless, there was greater access of the materials on the VLE, and downloads of the tutorials that were offered



CONCLUSION

Overall findings and possible future directions

CONCLUSIONS

Students do prefer using mainstream mobile devices over traditional separate assistive technologies given the choice to do so

There is a demand for training and support for the use of mobile devices by disabled students in order to help develop study skills

Tentatively, it was found that students from the universities did not like to attend separate classes, because it was thought they had a disability

It was difficult to time sessions to allow all to attend, therefore flexibility seemed to be an element that was needed for the course

Following the point immediately above, it would seem that students with disabilities appeared to feel comfortable accessing materials via the VLE rather than taught sessions

FUTURE RECOMMENDATIONS AND PLANS

A follow up survey of lecturers is planned in due course to evaluate its impact

The study is also being used as a critical model for future undergraduate and postgraduate teaching at Canterbury Christ Church University

- This is in response to the changes to the Disabled Students Allowance

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