

THE TEACHING EXPERIENCE

Optimising the teaching experience through improvements in teaching instrument design

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Abstract

This study aims to gain an understanding of the teaching experience, and how to improve this experience through improvements in teaching instrument design. Whilst the educator/presenter is the only user vulnerable to these circumstances, students/viewers of the user are also exposed to the negatively affected teaching experience. This contributes to worsening learning outcomes, less feedback and worsened educational stimulus.

This report will introduce the topic through a literature review which found that there was diminutive information on the topic. Through this a questionnaire was conducted with individuals who are involved in education to find key problem areas, which then could be translated into more refined interview questions. Three key themes were highlighted through my finding, these were a lack of control, which comes from with the ability to use teaching instruments and within the context environment, anxiety problems based on speaking and from this lack of controls and finally a lack of reliability with the use of tools and equipment.

This report will create a design proposal which will help with implementation of improved teaching instruments within what we call “the teaching experience” system. This will correlate with the resultant findings from the chosen methodology.

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Introduction

Humankind possesses a gift that we have been refining since the dawn of time. We are adept at captivating others with the complexity of our unique languages and can easily manipulate and sculpt the perspectives and views of others if desired.

As humans, we have also adapted to the use of tools in our everyday life, which assist in improving the overall human experience.

Similarly, the teaching experience is heavily influenced by the use and availability of teaching tools and instruments. The continual development of which is crucial for the sustainability and adaptability of learning in the future, as well as the teaching experience for educators and students and speakers in general.

Educators often reflect on their practice, enabling them to find weaknesses in their teaching style and improve (Berliner, 2004). Designers, especially Instructional Designers, also face a challenge in finding new ways to innovate and improve education. ("What Does an Instructional Designer Do? | Purdue Online", 2020)

In more recent years, the implementation of modern technology within the education system has improved the teaching experience. Teaching instruments and technology have enhanced the way speakers present in front of an audience. However, speakers still often face barriers with technology, especially unreliability which inhibit the overall teaching experience. Other barriers such as anxiety and audience disruption are bound to be a part of the pain points of presenting with an audience, however development in teaching technology may be able to lessen these issues.

There is limited research into the topic surrounding the development of instruments to improve the teaching experience. However, there is information that indicates the benefits of technology-enhanced learning. Technology allows students to learn at their own pace, access more resources, be engaged and develop with the technology that our society so heavily relies on (Cullen, 2020).

There is evidence to suggest that modern day education spaces be must redesigned to enable a new model of education in order to use technology as an enabler. ("How Has Technology Changed Education | Purdue Online", 2020)

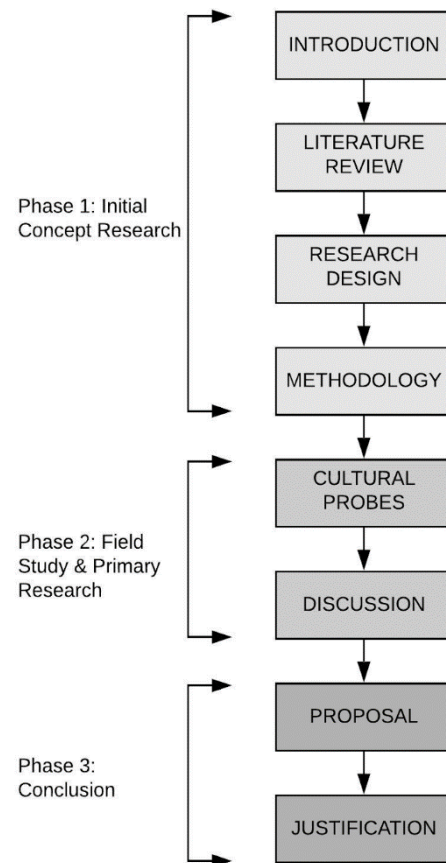


Figure 1 : Phases of Report

This study aims to gain an important and undocumented insight into the teaching experience, as well as ways to optimise it through improvements in teaching instrument design. This report will introduce the topic through a literature review and a research study. This research study will investigate teachers, students, and public speakers on the negative and positives of the teaching experience. It will highlight the specific areas where improvements are needed and gain insight into the overall issue.

This report will then offer a design proposal with clear suggestions into the implementation of improved teaching instruments that optimise the teaching experience within the system. This issue will lead to the resultant findings from the chosen methodology and analyse existing initiatives that are improving the teaching experience.
issue.

Literature Review

This literature review will gain an insight into what the teaching experience is, by analysing key focus areas. This first is understanding what the Ideals and Effects of Standardised Teaching Methods are and current initiatives to improve this teaching experience. The second is how the use of technology and instruments affect this teaching experience. In doing so, will allow opportunities for improvements into teaching instrument design.

The Ideals and Challenges of Teaching

The document specifies:

- That teacher orientated learning conditions centre student learning around objectively scored tests and assessments.
- That student orientated learning prompts productive and collaborative work.
- How a high-tech approach to learning can provide added stimulus and resources to a teaching environment.
- How a low-tech approach to learning allows students to interact with teaching stimulus.
- The benefits of kinesthetics in the learning process.

The Importance and Consequences of Good Teaching

Educators provide guidance and mentoring for students and play an essential role in their success and development. Leaders are the central influence in an individual's educational journey, as teaching conditions are often reflected in a person long after they have graduated (Pan, 2018). Reliable teaching cohorts positively affect a student's behaviour, wellbeing and achievement level, as well as provide a safety net of social and academic support.

Good teaching must stimulate a student's mind by providing inspiring and motivating learning resources and methods. One technique which is useful in doing this is providing new approaches to learning, that make a topic interesting and intriguing. The positive consequences of this include higher engagement, motivation and determination in the student.

Table 1. Incentive Categories Generated by Teacher activities (Pan, 2018)

Teacher activities	Behavior	A series of teacher's presentations behaviors in class aimed to complete the teaching, encourage and stimulate students' learning motivation, often accompanied by message.	General teaching behavior: lecturing, blackboard-writing Multimedia means: audio, video, PPT, etc. Oral presentation: storytelling, giving examples, telling jokes, etc. Material object demonstration: teaching equipment, experimental operation, etc.	Weak incentive Slightly strong incentive Strong incentive
	Message	Instruction that teachers provide in the hope of receiving students' responses aimed to encourage and activate students' learning motivation.	Assigning tasks, such as: group discussions Raising questions, Asking students to answer questions	Weak incentive
	Evaluation	Teacher's Evaluation of Students' behavior in Class.	Praise, Criticism	Strong incentive

As demonstrated in Table 1, each type of activity contains several different instructional modes or methods (Pan, 2018). A student benefits from new approaches to teaching and activities with incentives, which make a student want to learn.

Table 1 also noted that teachers should:

- Encourage student learning
- Provide set learning tasks for students to complete.
- Observe students and evaluate their behaviour and response to the learning task

The Challenges of Optimising and Improving Teaching

A challenge faced by the University and Schooling sectors is finding ways to improve an instructor's abilities to teach effectively consistently. Because an instructor has such a defined role in the educational system, any action will have an impact on a student's education and development, whether it be positive or negative. Some issues which regularly occur during presentations include speaker anxiety, audience disruption and disengagement (Curtis, Jones and Campbell, 2016). In general, professionals are to present in front of both small and large audiences. Those who experience public speaking anxiety may find certain career developments more challenging because of their lack of confidence. (Raja, 2017)

In their research journal, Farhan Raja outlined anxiety associated with public speaking and emphasized that professionals, when presenting, should focus on three key elements to improve their capability. It is important to be open with the audience, connect with the audience, be passionate about the topic as well as intently listen to the audience (Morgan, N. (2008). How to become an authentic speaker. Harvard Business Review, 11(86), 115-119.) Additionally, in order to combat audience disengagement, Raja and Nagasubramani (2018) suggest that education and training should be pointed towards creating curiosity in the minds of students (Raja and Nagasubramani, 2018).

Self-confidence also plays a key role in the effective transfer of information from teacher to student. In his literature, Tschannen-Moran proposes that Instructors with confident and self-assuring tendencies are able to create better results for their students (Curtis, Jones and Campbell, 2016).

Furthermore, Curtis, Jones and Campbell (2016) assert that audio and visual methods of teaching provide the most assistance to student understanding. Understanding an audience's capabilities is essential in allowing for deeper and focused interactions with these recordings to occur (Curtis, Jones and Campbell, 2016).

Current use of Teaching Instruments and Technology

In recent years, the improvement of education has shifted in priority and consequently teaching technology and instruments have become exceedingly important in educational environments. Informative communication and the technology which allows it, have also become valuable. With educational technologies perpetual gain in popularity, less care is being made, and most often are reaching the market before being evaluated and researched. Education technology is a systematic and organised process. This process includes instructional materials for students and how instructors organise their work. Escueta, Quan, Nickow and Oreopoulos wrote an evidence-based review in which they discussed these limitations and benefits (2017). Educational Technology or Ed-Tech lack the necessary research and context. With technologies going back and forth between acceptance or usage, often these tools become less appealing to the user, than basic technology. (Damewood, 2016)

Technological reliability is a problem faced every day by people around the world. In terms of education, technological reliability is crucial in helping students understand what teachers are communicating. This technological battle of reliability is at the forefront of Butler and Sellbom (2002) Barriers to Adopting Technology for Teaching and Learning, and Chizmar & Williams (2001) on "What do faculty want?". The common issues occurring are hardware failures, incompatible software, poor connectivity and overall technical instrument failure. The problem with modern Technologies is that it is demanding on the teacher; it increases the teachers training needs and creates more barriers on top of unreliability. Raja and Nagasubramani constitute a lack of time, access, resources, expertise and support (2018).

On the other hand, the use of modern equipment helps in the transfer of knowledge. Technology-enabled behavioural interventions are cost-effective and are creating positive effects for the students/audience. The assistance of modern technology creates a more efficient educational workspace which enhances the entire learning process. Screens that provide interactive environments allow users to engage in activities. These environments visually aid presentations or in activities, encourage physical user interaction. The use of visual aid in a learning form is a process that institutions use around the world. This visual aid allows the presentation to be more engaging and more user interactive.

Summary

Education is crucial in society; however, the lack of relevant technology and instruments can cause detrimental setbacks to speak and learning opportunities for teaching figures and students. Overall, because of the lack of research surrounding educational technology and instruments, such products are not focused on the user. Teachers and speakers lack the speaking ability because of the technology that they are using and the way that it affects them in the classroom and other environments. This literature review has reviewed the topic of teaching and speaking and the effectiveness of technology and teaching instruments. There is an apparent lack of research on the matter of actual teaching instruments that are relevant to today's society. While there is a gap that this provides, we have also analysed specific focus areas that can be pursued.

Second Method: *Interview*

Interview

The interviews will use a semi-structured and casual approach with questions formed based on the findings from the questionnaires. The interviewees were pre-established via networking and scouting. Three interviews were conducted with either people who use teaching instruments: student or teaching staff (this could come from a workplace) each approximately ten to fifteen minutes in duration. With approximately 20 questions regarding the pain points surrounding teaching and learning in the classroom.

Interview Analysis

This data was transcribed into Google Docs using their voice-to-text tool. The data was then categorised and sorted into the appropriate theme produced through the literature review. Relevant or questionable answers will be analysed and sorted. These themes will then create a multivariate graph. Identifying the pain points and showing a clear correlation to the aim of this investigation.

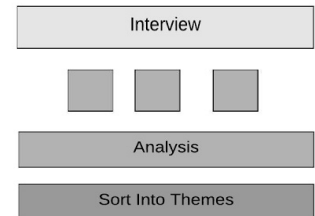


Figure 3: Interview process

Data Collection

The primary data collected from past and present students and workers (presenting data to a client) that have public speaking knowledge. They understand what it is like to be taught or to teach.

The participants were either enrolled or employed as a student or were experienced in public speaking. Each participant had first-hand experience in the classroom/teaching space as well as regular involvement in teaching/speaking.

During April and May of 2020, the data was collected. The questionnaire participants were invited through social media, and email and the interviewees were scouted.

With the permission of the participants, the interviews were recorded and transcribed in real-time using voice-to-text technology.

Recommendations & Analysis

First Method: *Questionnaire*

The key themes discussed in this section were found using a semi-structured questionnaire with a total of 40 participants.

The participants varied in ages between 18 and 74 with the largest group being 57.5 % (18-24), and the second largest being 15% (45-54).

Figure 1 provides an overview of the specific environments in which the participants generally speak in. The findings indicate that the majority of participants tend to speak/present in a workplace environment. Although the overall demographic was clearly diverse which allowed for answers to come from other perspectives.

What kind of environment do you speak to an audience in?
40 responses

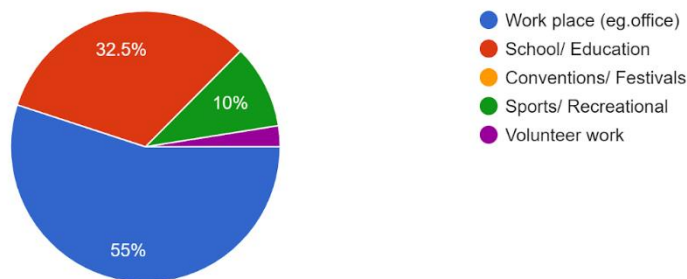


Figure 1: Pie chart on User Environment in respect to speaking in front of an audience.

In terms of speaking in front of an audience 92.5% of the participants were at least somewhat experienced. This is important because having some sort of previous knowledge into speaking or presenting meant there was at least a basic understanding of how teaching instruments affected them. The answers from the participants are then more credible and show realistic responses.

It was found that the two biggest difficulties faced by the participants when speaking to an audience was nervousness (47.5%) and technological failure (30%). In terms of nervousness 72.5% of participants are nervous when speaking with an audience. With 57.5% of participants rating this nervousness to be over 5 out of 10 on a Likert type scale. which means that few are able to comfortably talk with impact in front of viewers. In terms of technology failure 87.5% of participants at least once have had technological issues and/or failure occur during a presentation.

Interestingly respondents' main cause of this anxiety stemmed from the fear of something going wrong; things that are out of their control. With this in mind, this response and participants having at least one technological failure shows a clear correlation. However,

other factors like general nervousness, which stems from organization and personal anxiety should still be considered.

The majority of participants' who said that they were affected by this said that their speaking ability degraded and their ability to teach what they were saying worsened. The excerpt from the questionnaires' qualitative data below testifies to this.

How does this effect you when speaking with an audience?

40 responses



Figure 2: Excerpt from Qualitative Questionnaire Question

When considering the design of teaching instruments, identifying the main technology used can help identify key problems areas. While the respondents' answers were mixed there was a clear majority being (62.5%) computers which can be identified in figure 3.

This technology was preferred because of its interconnectedness with the programs they were using and was generally a better method of communication.

What is your most used technology when speaking or presenting to an audience?

40 responses

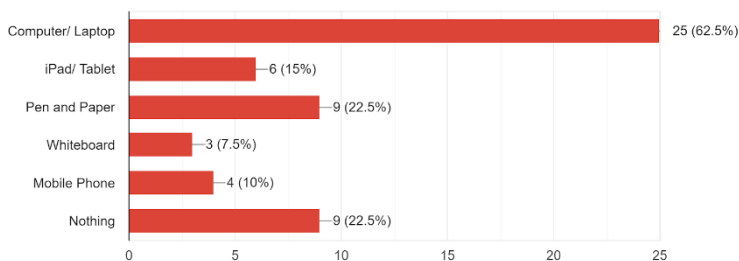


Figure 3: Bar Graph on the most used technology when speaking or presenting to an audience

Several relationships were found between the most popular base technology and the preferred teaching instrument. The main preferences of teaching instrumentation were found using a checkbox style question. Figure 4 presents this data and it was found that the most popular technologies were the mouse, projector and clicker.

Which teaching instruments (technology) do you use?

40 responses

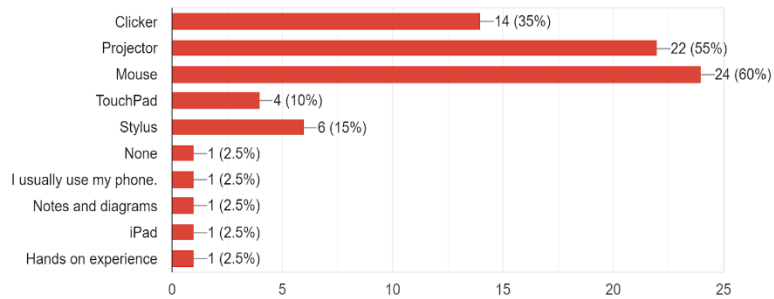


Figure 4: Bar graph on the teaching instrument used.

This has a clear correlation with improved teaching skills and ability to present more efficiently. Figure 5 supports this, with 90% of the participants finding that it helps, even if minimally.

Are your teaching skills improved by the use of teaching instruments?

40 responses

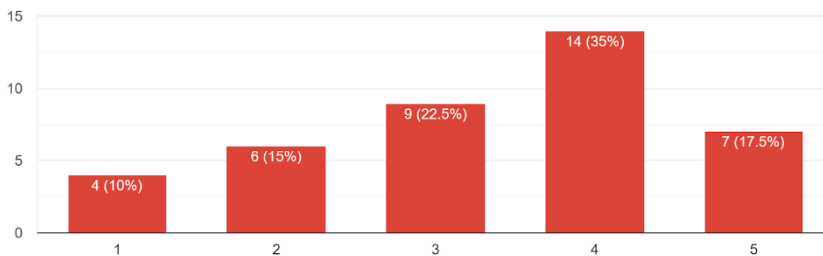


Figure 5: Bar graph on the if instrumentation improves teaching skills.

A qualitative short answer question was asked after this to find key problem areas, so that these teaching instruments might be improved. Generally, it was found that the users key problem areas were that they didn't have enough reliability prior and during their presentations. Participants commented that they didn't have enough control while presenting, "...to have control whilst presenting", and wished to enhance their teaching ability "...they would help me convey my message more clearly".

While it has been established that teaching instruments help create better teaching experience, 87.5% of participants have incurred technological failures during a presentation. With 45% rating $\frac{3}{5}$ or above on how often they experienced technical issues. At the moment these technologies (usability and control issues) are not simple enough according to Figure 6. Now it's clear that improving the reliability and user friendliness will greatly benefit the users of the equipment and therefore the teaching experience.

How often do you experience technological issues and/or failure during a presentation?

40 responses

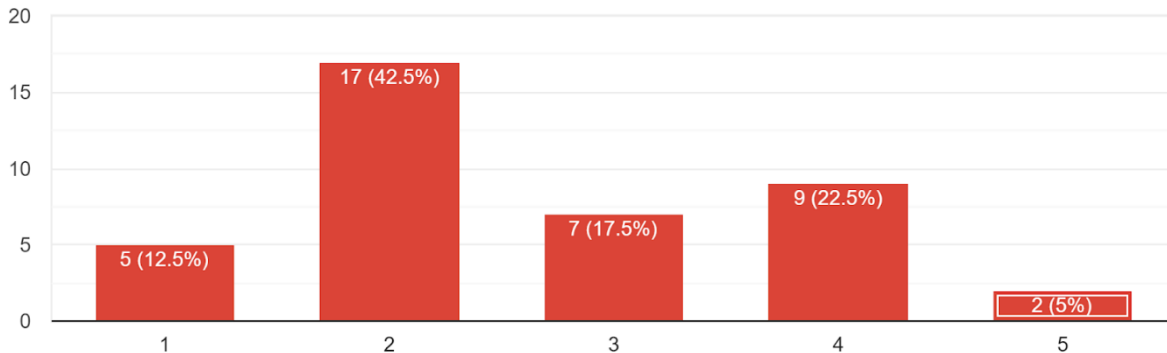


Figure 6: Bar graph on how often participants experience technological issues during a presentation.

Now that we understand that there is a lack of usability and control issues, we can verify there is a correlation between these and the effectiveness of the presentation. Figure 7 below identifies 57.5% of participants said that the reliability of their technology affects their presentation more than half of the time. Notably participants or those attending presentations become distracted and this reduces the effectiveness of the presentation. It can result in re-shuffling of the agenda and of course reduce the available time until the issues are resolved

How often does the reliability of your technology effect your presentation?

40 responses

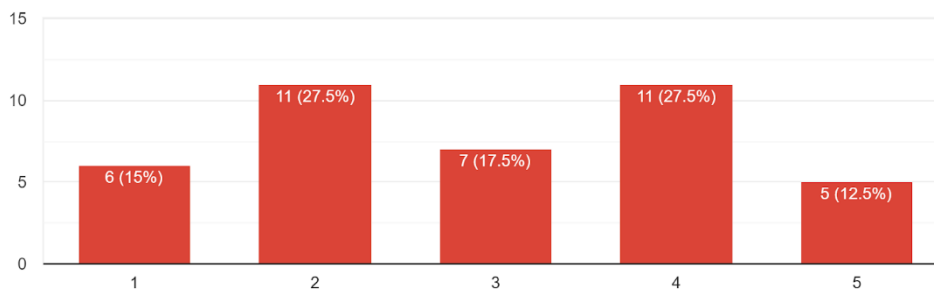


Figure 7: Bar graph on the reliability of technology in presentations.

Through a qualitative, short answer response, type question, it was found there were two main key themes: “Better connectivity” (interconnectedness) and that the technology was more reliable, “Be less faulty”, “Work consistently,”.

Using a series of short answer questions, three main instruments were investigated to gain an insight into the pain points in the user experience. The three devices were presentation clickers, mouse’s and projectors.

The first question asked the user what they thought would improve the design of presentation clickers. The main pain points mentioned by the participants were the size, feel, button size, labelling, battery life and setup of the clickers.

One recurring theme in the comments included that the clicker is awkward and large when held in the hand. As well, users mentioned that they often “mistake the buttons” when presenting, and that “larger and clearer labelling” and “buttons that are identifiable by touch” would allow users to maintain sight with the audience without having to first reference button order on the clicker.

Another recurring theme included that during presentations the clickers “battery was dead” and that there needed to be an “improvement in battery life”. It was also mentioned that the clicker was a “struggle to set up” and needed “better connectivity” and an “easier setup”.

As well as these pain points several useful suggestions were made to improve the design of the clicker. To begin, one suggestion was to “implement a microphone into the top of [the clicker] to ensure that the audience” can hear the speaker. In addition, another suggestion was to make the clicker “slimmer and introduce a stylus point to one end, allowing the pointer to have various functions”. Another suggestion was that the clicker could include customizable buttons which can be mapped to various functions of the presenters choosing”. These are potential areas of focus for the design proposal when considering the aim.

The second question asked the user what they thought would improve the design of the mouse. The main pain points mentioned by the participants were the connectivity, functionality, sensitivity, and battery life of a mouse.

One recurring theme in the comments included that a wireless mouse needed “better” and “further connectivity” so that it could be used at a “further distance” when presenting. Another recurring theme was that a wireless mouse needed to “function on more irregular surfaces” as well as have “increased sensitivity” so that “it offers a greater area of range” and can be “used while standing and presenting away from [a] desk”. The answers also suggested that a mouse should be “designed so the hand is in a better position when standing” so that it forms a more “comfortable grip over time”. As well, that the mouse requires an “increased battery life”.

Several useful suggestions were made to improve the design of the mouse. To begin, one suggestion was to adapt the mouse design and include “more buttons, like a gaming mouse but for a professional setting”. Adding on to this, another suggestion was to have a mouse “specifically designed for presentations”.

The final question asked the user what they thought would improve the design of projectors. The main pain points mentioned by the participants were the functionality, connectivity, setup and focus of the clickers.

One theme suggested that the projector was too “heavy and big” and easily got “bumped and moved around” during presentations and suggested that they should be made to be “less

awkward”. As well as this, another theme highlighted that the projector should have “better connectivity” as well as “Better set up assistance”. Furthering on this, it was also highlighted that the projector should have improved “backlighting or top down lighting to reduce shadows and improve focus” as well as be “easier to move and focus.” An important suggestion made surrounding the design of the projector included that “having a better light source or a better camera would ensure that the audience can clearly see [what] the presenter” is doing.

Analysis & Findings

Second Method: *Interview*

This section discusses the main themes found through semi-structured interviews. Utilizing a thematic analysis, two major themes were found from the participants responses and perspectives on the teaching instrumentation they use. From the coded-transcribed data. Three themes were found on the perspective of current teaching instruments. The resulting data was displayed below (Table 1).

It can be seen that functionality (59%), emotions (32.5%) are the overarching themes whilst external factors, while still prevalent, only accounts for 8.5%. There was a clear divide within the user group with some participants favoring their emotions and other favoring functionality of the teaching instruments. External factors were found to impact the users the most in terms of which theme was more prevalent to them. For instance, Interviewee #1 prioritized functionality and the participants external factors revolved around his working environment and the amount of time the participant had. While participant #2 prioritized emotions with external factors revolving around them being a student.

This section presents the functional aspects from the participants and this relationship with their teaching instrumentation. Functionality was evidently the highest referenced category when discussing technology use and complications within the functionality of the teaching instruments, with functionality being the majority of codes referenced throughout interviews. The subcategories within the functionality of teaching instruments were, usability, control over technology, the flexibility and improvements in the teaching experience.

Many of these references in terms of functionality, often identified pain points and possible solutions. Figure 7 provides one example of this functionality purpose. In this example, the participant details how they don't have control (functionality) when using some devices and that some devices solve different problems.

What type of design changes would help you speak/teach better?

And yes I do use a laser pointer at times, but it's quite simply just an aid to stop me getting in the way of the screen. I use a clicker to change pages when necessary, but I'm better off with fewer devices and really simple ones at that. For example, you may wish to change the page or you may wish to click on a piece of data, but that doesn't help when you fumble around with devices - the message gets lost! For this reason, I am more comfortable with a mouse. If it was a big screen and I'm standing 10 feet away, well obviously I'd use a laser pointer and clicker as it's better for the job. So you could make a laser pointer with the clicker integrated into it if you that if that makes sense if there was one available.

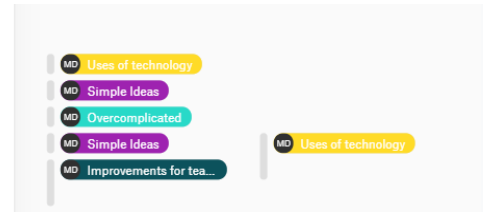


Figure 7: Excerpt from Interview A

The functional purposes of teaching instrument design had major correlations with the aspect of control. This aspect of control included better connectivity and being able to control faults and consistency. There are a lot of problems that people face with teaching instruments, that they are almost unwilling to try other devices because of this. These factors that advocate better control in terms of teaching instruments are found to relate to the personal values over each individual.

When considering improving teaching instrumentation, it was found that participants favored the use of technologies that had the least possible problems, this being the mouse. However, interviewees still had problems with the most “familiar” device, with it creating problems that other devices could solve, i.e. the clicker. They were found that outweigh the otherwise expensive upfront costs and other unknown conditions of this undeveloped technology. Interview transcripts below testify to these findings:

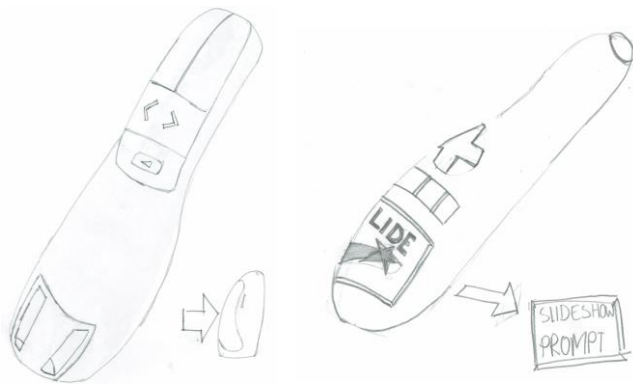
As a presenter what are some pain points with your speaking?

I'm not a full-on presenter, I probably tend to look back at the screen and I tend to look at the screen as a prompt for me not to forget different topics and different items.



Figure 8: Excerpt from Interview A

Potential Designs



DESIGN CONSIDERATIONS: FORM & USABILITY

Design of Instrumentation: Clickers

Size and feel

- Sometimes too big
- Less awkward to hold
- More ergonomically designed to fit the hand

Buttons and labelling

- Having a design that makes all buttons identifiable by touch is a big help as there's less distraction away from the audience
- More options on buttons
- Labels may make easier to use for some
- INSTRUCTIONS.
- Simple controls
- Potentially more detailed buttons to do more actions if necessary
- Raised bump or something that makes the buttons identifiable by touch.
- Larger primary buttons and option for customized buttons
- Clearly different feeling forward and backward buttons

Battery

- Better battery life or charging station
- Improvement in battery life

Setup

- Better connectivity.
- Easier setup.
- Simplify setup & charging
- If they connectivity was more secure
- Bluetooth communication vs infrared light communication

Improved Design

- Maybe some sort of stress relief thing. Like when fidget cubes were trendy it would be cool if there was a useless button or trackpad or something that a presenter could fidget with to release nerves whilst still looking professional.
- If they had mouse control for clicking links without going back to the computer for example
- Implement a microphone into the top of it to ensure that the audience can hear you. You could also change the design to become a lot slimmer to introduce a stylus point to one end thus allowing the pointer to have various functions for the end user.
- Add more functionality to it, maybe include customizable buttons which can be mapped to various functions of the presenters choosing.



Design of Instrumentation: Mouse

Connectivity and range

- Further distance wireless connectivity
- The ability to use a mouse wirelessly through Bluetooth would improve the design

Sensitivity and functionality

- Works on more surfaces. Increased sensitivity.
- More functionality and programmable buttons
- Easy glide and click, not clunky
- If I didn't have to use them on a flat surface

Comfortability

- Designed so your hand is in better position when standing
- More ergonomic grip, allows usage on multiple surfaces with need of mouse pad
- Comfortable in hand, easy gliding
- better shape for more comfortable grip over time
- more portable design that works on more surfaces

Battery

- Better battery

Improved design

- More buttons, like a gaming mouse but for a professional setting
- Specifically, designed mouse's for presentation. Wireless ones
- Usable on any surface, even in air and activated by a button
- Clicker attachment
- Programmable buttons



Design of Instrumentation: Projectors

Functionally

- Sometimes block the view of the screen for some
- More stable/ sometimes get bumped and move around
- Hard to see from behind it while writing
- Able to project in well-lit up area
- Affordable portable projectors
- Less awkward when writing and looking at the screen
- Work in brightly lit rooms must turn the lights on and off over and over throughout my presentation so that my audience can see.
- If these were more compact as many are quite heavy and big
- Increase the quality so it's easier to see or improve stability so it doesn't shake all the time.
- better sensitivity when writing in bright spaces

Connection

- More compact and Bluetooth
- Better connectivity to other documents and better scanners

Setup

- Easy to set up
- Speaker attachment
- Good strong image, easy to set up and project
- Better set up assistance such as guidelines for extent of sheers

Focusing

- Backlighting or top down lighting to reduce shadows and improve focus
- Easier to move and focus.
- Improved design and concept
- Drawing on paper as a stylus - marks it on screen, not on actual document.
- Digital projections from workspace instead of having to look down past the projector blocking view.
- if I could see my work on the screen and a better scanning system
- digitally stream instead of project
- Simpler settings, less temperamental

Design Proposal

Aim

This project aims to improve and/or redesign existing teaching instruments in order to help optimise the teaching experience.

Objectives

The list of objectives is compiled to ensure a successful delivery and submission of this project. A timeline for each stage of the design process is outlined below.

Scope of Project

The project encompasses improvements to the current teaching experience and the resultant behaviour of people, who present to an audience (teaching). This is to be achieved through exploring the equipment and instruments that have or would be utilized, with reflection of the positive and negative characteristics that have been identified to date.

The project will integrate teaching instrumentation (presentation aids) used in today's society and how the characteristics should be maintained and/or improved, to facilitate a better teaching outcome, for stakeholders. Specifically, presenters, the participants and their respective companies, and the education standard in general. The project will be fulfilled, when the design process has been accomplished and all deliverables are completed. This will lead into the presentation of an overall product to the client.

Teaching Instruments

This project will consider the use of teaching instruments, specifically: - the mouse, the projector and clicker and improve on their designs to better fulfil the user's needs. These improvements should include improved control and convenience. It's expected that cost savings should eventuate in the long term.

Interactions between connected devices, such as a laptop computer, video-conferencing hardware and the devices themselves, would be considered to enable improved remote interaction and overall functionality. Ensuring simplicity and reliability will be a major consideration factor in helping solve the identified shortcomings associated with existing teaching instruments.

Anxiety

This project must draw on the perceived associations between technological issues and the resultant secondary burdens afflicting the users. It should consider anxiety and nervousness and facilitate simplicity and effectiveness of use, in order to alleviate the anxiety stemming from failures that are out of their control.

Justification

This project has indicated there is a market gap in the development of suitably reliable, simple presentation equipment, which are relied upon as teaching instruments. Functional and technological expectations of users are becoming more advanced and the use of different types of software is evolving.

In accordance with the design stages identified herein, a product is to be developed and optimized, in order to cater to the evolving needs of the users. It is a rationale that improving the experience for the teachers and presenters, will result in improved communication to the students, participants and the forum. It is envisaged that increased effectiveness would improve student and participant education in general.

Context

This project should consider factors such as: educational and information communication effectiveness; general environments and locations where the product is used; simplicity of set-up and use; increased functionality; maintenance, upgrading and product care.

Most importantly it should be developed to be beneficial to the teaching experience, in reflection of the market research conducted.

Design Criteria

The project will be reflective of the design criteria listed below. Each of the criteria must be considered and implemented within the design draft. The Draft should be reviewed and critiqued by users in a design trial, to ensure the outcome meets with the approval of the target market.

A project schedule timetable will include key dates, to provide stakeholders with anticipated review times and product development expectations.

General Design Criteria	Applicable Design Considerations
Form / Function	<ul style="list-style-type: none"> - Appearance (appealing and appropriate) - Simplicity of set-up - Ease of use (within presentation) - Functionality (can perform all the tasks) - Ergonomic (lightweight, suitable for extended use periods, fits into hands without causing stress on joints etc) - Support user interactions and requirements - Improved design and capabilities (refer to design considerations for more information) - Portability - Suitable bandwidth that does not suffer interference
Standardization and Modularity	<ul style="list-style-type: none"> - Software updates - Support computer software's - Consideration of a Standardised model that can be upgraded by additional modules
Usability Aspects	<ul style="list-style-type: none"> - Visual affordances - Better GUI and, placement of Buttons (refer to design considerations)
Manufacturing	<ul style="list-style-type: none"> - Importation of standard parts - Possible production of custom parts - Affordable without compromising quality - Adhere to Australian Standards for manufacture - Parts and accessories made readily available - Robust construction (able to be dropped without breaking)
Maintenance	<ul style="list-style-type: none"> - Easily Maintained (by user) - Wireless charging - Plug and Play software/firmware upgrades - Support should be provided to users
Safety Requirements	<ul style="list-style-type: none"> - Product should operate in safe manner - Ergonomically formed in accordance with Australian Standards - Compliant to Australia Standards for electronic devices - No sharp edges

Project Process & Timeline

Stage: Week 1

DESIGN RESEARCH

- 1.0 PROJECT BRIEFING
- 2.0 BACKGROUND RESEARCH
- 3.0 CRITERIA DEVELOPMENT

Stage: Week 2

CONCEPT DEVELOPMENT

- 1.0 INITIAL IDEATION PROCESS
- 2.0 EVALUATION & CRITIQUE
- 3.0 SECONDARY IDEATION PROCESS
- 4.0 INITIAL CONCEPT PRESENTATION

Stage 3: Week 6

DESIGN DEVELOPMENT

- 1.0 CONCEPT SELECTION
- 2.0 PRODUCT DEVELOPMENT
- 3.0 MANUFACTURING DESIGN
- 4.0 UX + UI DESIGN DEVELOPMENT
- 5.0 USER TESTING
- 6.0 MODEL MAKING + COMPONENTS
- 7.0 SAFETY & MAINTENANCE

Stage 4: Week 13

FINAL DESIGN PRESENTATION

Justification

Introduction

Eazy Breathe is an innovative design developed to help assist educators in creating a positive teaching experience. Educators are paramount to the continual development of our next generation of students. With the limited designs developed towards educators in terms of their overall teaching/speaking ability. The availability of new teaching tools and instruments which will help with the development of teaching experience is crucial for the sustainability and adaptability of learning in the future, as well as the overall teaching experience for educators and speakers alike.

This chapter hones in on the key features of the final design and details on how the Eazy Breathe is assisting educators in creating a positive teaching experience.



People

My primary users are educators, they are crucial to the development of society and require clear communication between the audience. The variance of knowledge and skills between speakers often make it a challenge to design for. Eazy breathe takes an extra step to grow with the user through a developmental survey after each day, open forum and intuitive built-in haptic mechanics.

This user group has a detrimental effect on its surroundings; their students and are thus interconnected. This interconnection means that when the educator has a positive teaching experience, they will have a direct effect on their students experience within this environment. Therefore, by enabling a positive teaching experience, the user will be affectedly less by technical problems, anxiety and their overall speaking ability. Thus, creating an overall better experience for everyone within this system.

Context

The overall teaching experience is heavily influenced by the use and availability of the tools used and is also affected by elements outside of the user's control. With the nature of public speaking the speaker is often at the mercy of their environment and this can often cause people to feel less confident or anxious.

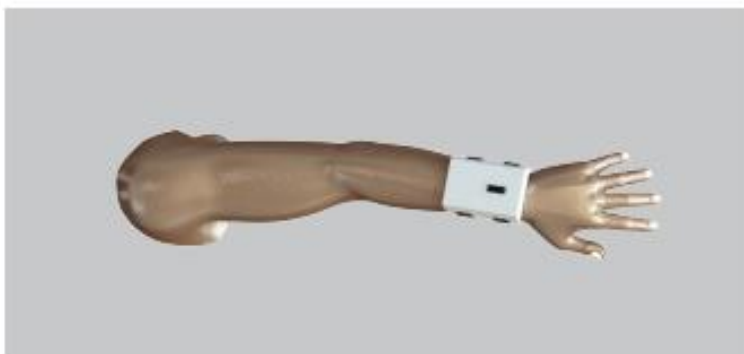
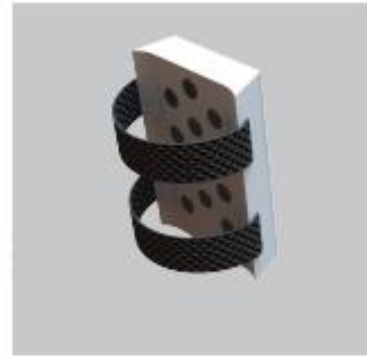
Eazy Breathe primarily will be used within the educational environment. This being in classrooms, lecture halls, and whenever educators might be speaking in front of people. Once the product has been iterated and can be manufactured efficiently, Eazy Breathe can be sold not only in the educational system but can branch out to the general public.

Eazy Breathe is designed to be used within the educational system, specifically for teachers who lack the confidence to speak clearly, suffer from anxiety and want to learn to communicate better. With this in mind, the product must be able to seamlessly fit into the context without creating more issues to the current process. Eazy Breathe Will need to be ergonomic and compact so that it does not restrict the user and can be easily accessed. Eazy Breathe will be in use most of the day; this is because it documents the heart rates beat per minute that is collated on the app. The overall frequency of use requires the product to be durable, ready to use and comfortable.

Technology

Eazy Breathe utilises existing technologies found in Apple watches and, in more recent applications, in radiology to help reduce user anxiety. The system works by calculating the average heart rate per minute (heart rate sensors), which allow for analysis and deconstruction of the heart rate that coincides with increased anxiety. When this happens, Eazy Breathe uses haptic actuators to create dynamic vibrations that simulate the feeling of an empathetic touch. These haptic actuators are programmable by the app and have an option for lower frequencies for adaptability.

This device also utilises an app which will be able to connect with the education community for self-betterment purposes and to be able to track your levels of anxiety/heart rate. Having an interconnected community helps further development of the app and create better feedback. This interconnect is imperative to the longevity of the product and the ability for better user feedback.



EAZY BREATHE



Ergonomics

Eazy Breathe is designed for educators, which is a broad user group and encompasses any type of person. This is why it has been designed to be used by the 99th percentile man and the 1st percentile woman. The use of a strap type design enables for varied arm widths to be used comfortably. Medical-grade plastic is the main material and allows for Easy Breathe to be used vigorously without failure or discomfort.

App Integration

One of the most imperative design choices with Eazy Breathe was integrating an app. Utilising this app allows people to distinguish when they have heightened anxiety levels throughout the day.

The Eazy Breathe collects average heart rate beats per minute. The data is then transferred to the app which collates and shows the user key periods in real time. This data helps the user understand where their problems arise and help them improve. This device is there to help people who struggle with speaking and want to develop their communication skills. This can then be passed on to others and create a chain reaction of overall positive teaching. The app helps create a community where people who have the same sort of anxiety or poor speaking ability can help others and to learn to communicate better.

This helps the user understand their current skills in speaking/teaching. Allowing for self-betterment and development of the teaching experience.

Haptic Technology

Eazy Breathe uses haptic actuators to create dynamic vibrations. This creates an empathetic touch sensation on the user's arms, which in turn helps ease stressed or anxious users. This means anxiety created through technical issue, lack of control and poor communication skills can be eased and a better teaching experience can be obtained.

When we look back at the questions from the survey and questionnaire, we found that anxiety was a key negative contributor to the overall teaching experience. On top of that, there were also technical failure and user control problems, which are two main contributors to problems with anxiety.

HR Sensor

Eazy Breathe utilises HR sensors to monitor the users heart rate. Around the clock monitoring when public speaking helps users stay within the personalized stress threshold. When this is triggered the module receives the signal and starts the dynamic vibrations located at the bottom of the device. At this time the user has full control of whether to turn it off or change the frequency depending on the situation.

Manufacturing

The overall manufacturing cost was \$27.68 With electronics and if mass-manufactured can be significantly less

While the manufacturing at the moment takes around 4-7 days by me alone. With printed PCBs rather than basic Arduino boards production can be faster and cheaper and making the design much smaller.

Conclusion

In summary the project will focus on the way that presenters utilize teaching instruments within the education and business sectors. It will provide an understanding of the relationship's speakers have with their teaching instrumentation, the benefits and limitations of these instruments in a presentation setting and how we can improve on these existing instruments to optimize the teaching experience.

Using the data found, the project recognized three main problem areas, which were: a lack of control; anxieties associated with usage; and unsupported functionality. Extrapolated this indicates benefits in the teaching experience can be achieved by:

- Reducing stress and anxiety disruptions of presenters
- Increasing confidence levels of presenters (having more control)
- Reducing lost time or delays for both presenters and participants
- Increasing comprehension and understanding of participants
- Less technological failure

Helping people understand that by improving teaching instruments, both the delivery and receiving of information becomes better and it can reduce anxiety that people experience.

This project hopes to allow designers to better explore this issue through the research, findings and recommendations surrounding the development of teaching instruments. Improvements in these areas tend to be limited, which makes this a more viable and beneficial project.

Further with respect to the aforementioned it will provide benefit to the education sector, as a whole and businesses in general if the communication and comprehension levels are improved - all by virtue of improvements to the teaching instrumentation.

Eazy Breathe Creates an entirely new experience for educators. The continual development of which is crucial for the sustainability and adaptability of learning in the future, as well as the teaching experience for educators. My device was developed by looking at the main problems faced when speaking, these were technology failure, general nervousness and unease and overall speaking ability of the user. If we improve the teaching experience, we can better educate our next generation, which is imperative to the future of our world.

Appendix

Questionnaire Findings

How old are you?	How often do you speak in front of people?	What kind of environment do you speak to an audience in?	What is your most used technology when speaking or presenting to an audience?	Explain why this is your preferred technology. (optional)	What is the biggest difficulty you've faced when speaking with an audience?
55-64	5	School/ Education	Computer/ Laptop, Whiteboard	Promethean Board	Audience Disruption
45-54	5	School/ Education	Computer/ Laptop	It is set up for me at work	Technology Failure
18-24	2	School/ Education	Computer/ Laptop	it is an easy method of communicating information to the audience quickly.	Technology Failure
18-24	2	School/ Education	Computer/ Laptop	It's easiest and what I do most my work on, so it is easy to transfer to a presentation format.	Nervousness
18-24	4	School/ Education	Computer/ Laptop, iPad/ Tablet	Because I am familiar with the technology.	Nervousness
45-54	2	School/ Education	Computer/ Laptop	Taking it with me everywhere	Nervousness
18-24	3	Work place (eg.office)	Computer/ Laptop	Computer have the power to present 3D models	Nervousness
25-34	3	Work place (eg.office)	Computer/ Laptop	Required as the work that is usually being discussed is through a CAD program	Nervousness
18-24	1	Work place (eg.office)	Pen and Paper		Nervousness
18-24	5	Work place (eg.office)	Computer/ Laptop, Pen and Paper		Nervousness
18-24	1	Work place (eg.office)	Computer/ Laptop		Nervousness
45-54	3	Work place (eg.office)	Pen and Paper	Easy to take notes and mark up printed documents shared with group for discussion	Audience Disruption
18-24	3	Work place (eg.office)	Pen and Paper, Nothing	Keeps it conversational and engaging	Nervousness
18-24	2	Work place (eg.office)	Computer/ Laptop, Pen and Paper, Mobile Phone	Pen and paper is good for conveying ideas quickly, computer is good for high fidelity, mobile phone is good for convenience	Nervousness
18-24	4	Work place (eg.office)	Computer/ Laptop	In case I wanna include a funny PowerPoint or video or something like that	Technology Failure
18-24	5	Work place (eg.office)	Computer/ Laptop, Pen and Paper, Nothing		Nervousness
45-54	5	Work place (eg.office)	Computer/ Laptop, Mobile Phone	I use my computer because it is where I keep my workplace organised. My work provides me with the software I use.	Audience Disruption
18-24	2	Work place (eg.office)	Nothing		Audience Disruption
18-24	4	Sports/ Recreational	Nothing		Nervousness
55-64	5	Work place (eg.office)	iPad/ Tablet, Pen and Paper		Technology Failure
18-24	3	School/ Education	Computer/ Laptop		Nervousness
18-24	5	Work place (eg.office)	Mobile Phone, Nothing		Audience Disruption
18-24	4	School/ Education	Computer/ Laptop	Easier to Present with	Technology Failure
25-34	2	Work place (eg.office)	Computer/ Laptop	Ease of use	Nervousness
65-74	5	Work place (eg.office)	Computer/ Laptop		Audience Disruption
65-74	2	Volunteer work	Nothing		The microphone doesn't work
25-34	2	Work place (eg.office)	iPad/ Tablet, Pen and Paper, Nothing	iPad to quickly take notes and amend documents, paper for quick notes and workings, nothing when a general discussion update	Audience Disruption
18-24	2	School/ Education	Computer/ Laptop, Whiteboard	Generally when I'm speaking in front of people I will have a presentation which can be displayed on a whiteboard with a computer and projector.	Nervousness
55-64	3	Work place (eg.office)	Computer/ Laptop, Whiteboard	Information is generally contained in spreadsheets and flowcharts. Feedback is written onto the whiteboard.s	Technology Failure

18-24	4	Sports/ Recreational	iPad/ Tablet, Nothing	I use an iPad to show examples and to communicate and list of what needs to be done, for the most part I do not use technology as it can take too much time to set up and it is most times not necessary in my field	Nervousness
18-24	2	School/ Education	Computer/ Laptop		Technology Failure
18-24	5	Sports/ Recreational	Mobile Phone		Nervousness
18-24	3	School/ Education	Computer/ Laptop		Technology Failure
18-24	2	School/ Education	Pen and Paper	the freedom it brings to help you explain what you are presenting	Nervousness
18-24	1	Work place (eg.office)	Nothing	More efficient	Audience Disruption
55-64	5	Work place (eg.office)	Computer/ Laptop		Technology Failure
65-74	4	Work place (eg.office)	Computer/ Laptop		Nervousness
45-54	5	School/ Education	iPad/ Tablet		Technology Failure
55-64	3	Sports/ Recreational	iPad/ Tablet		Technology Failure
45-54	5	Work place (eg.office)	Computer/ Laptop		Audience Disruption

If other, what is it?	Do you get nervous when speaking with an audience?	How nervous do you get?	What may cause your anxiety?	How does this effect you when speaking with an audience?	Which teaching instruments (technology) do you use?	Does teaching equipment help you speak in front of people?
	No	2	Disruptive students	I get distracted.	Projector, Stylus	Yes
	Yes	7	General anxiety disorder	Muddled speaking	Clicker, Mouse	Yes
	Yes	3	Organization	Depends on the situation	Clicker, Projector, Mouse	Yes
	Yes	10	Lack of confidence and being overwhelmed	I end up speaking really fast and stumble over a lot of words.	Projector	No
	Yes	10	I get anxiety. I don't like being in front of an audience.	I stutter and cannot think.	Projector, Mouse	Yes
Sometimes push wrong buttons and lose the track of the speech	Yes	8	Not speaking in front of an audience so often	I get worried that my speaking won't go fluently	Clicker, Projector, Mouse	Yes
	No	4	Unprepared	If I don't understand the topic, I cannot justify my decision during the presentation	Mouse	No
	Yes	8	I think the reason I get nervous is because the audience isn't giving me constant feedback as I would be getting in a personal conversation. I don't know how they're taking what I'm saying.	It makes me second guess what I'm saying and that can affect the flow of the presentation	Projector, Mouse	No
	Yes	7	The probability of messing up	Speak faster and not pronounce word properly	Clicker, Projector	Yes
	Yes	10	Not speaking loud enough or stuttering	Makes me speak worse	Mouse	Yes
	Yes	4	Too many people	I get very shy	Clicker	Yes
	Yes	3	Being disorganized or unprepared	Meeting may not flow as smoothly so aim to be well organised and informed on topic	Projector, Mouse	No
	Yes	6	Worried about 'messing up'	Bit anxious/less comfortable at the start but goes away most times	Clicker, Projector	Yes
	Yes	7	No idea, probably the volume of people. I'm usually fine with small groups.	Sometimes I'll shake and have to actively stop, or I can lose my voice quite easily	Clicker, Projector, Mouse	No
	Yes	7	The fear of messing up and looking foolish	It helps a lot; nerves make you focused so you actually do a good job.	Clicker, Projector, Mouse	No
	Yes	5	Public Speaking isn't my strong suit. Unless it is something, I know a lot about and am passionate about it.	I tend to speak a lot faster and become more monotone	Clicker, Projector, Mouse, Stylus	Yes
	No	4	Not explaining myself enough for the audience.	I get worried that I am not saying the right thing.	Mouse	Yes
	No	3	Large audiences	I stutter my words slightly	None	No

	Yes	5	Speaking to an audience	I suppose it affects me a lot	Mouse	No
	Yes	7	My technology cuts out sometimes and I don't know how to fix it	I stutter and lose my place when I am talking	Stylus	Yes
	Yes	6	Judgment from others	Less confidence in speaking. Errors occur	Clicker, Projector	Yes
	No	2	Uncertainty	slowed speech	Mouse	No
	Yes	6	Failure	I tend to stutter	Clicker, Projector	Yes
	Yes	7	How to communicate with many people	Makes me nervous	Mouse, Touchpad	No
	No	2	I don't really get anxiety as I have been presenting for my job for years.	I am fine.	Projector, Mouse	Yes
	No	2	I don't really get nervous.	I am usually fine as it is a small group usually.	I usually use my phone.	Yes
Disruptions from mobile phones and everyone not being prepared for meeting	No	2	Not being prepared and a new audience or a dominant personality overriding meeting	Sometimes harder to cover all information and to keep on task	Mouse, Touchpad, Notes and diagrams	Yes
	Yes	6	Just nervous that I'll mess up and be judged	I tend to speak quickly throughout my presentation due to nerves	Projector	Yes
It is the time delay as a cost when 40 personnel all get delayed when setting up or by glitches	Yes	6	In my head...so fear of not being accepted. Once I start it's all gone.	Can result incoherent or confused subject matter	Projector, Mouse, Touchpad, Stylus	Yes
	Yes	6	When at work I speak to children and mostly have no anxiety, for something such a uni presentation my anxiety stems from the potential of being wrong in front of peers	Stumbling on words, sweating, racing heart	iPad	No
	Yes	6	Fear of something going wrong	Less confident to E when speaking	Clicker, Projector, Mouse	Yes
	Yes	5	Stuffing up in front of people	Rushing causes more frequent mishaps	Mouse	No
	Yes	7	The amount of people I am speaking to	I stumble over my words, and worry I might repeat myself, or bore the audience	Touchpad	Yes
	Yes	7	Not forming my sentences correctly.	I start thinking about how I screwed my words up instead of thinking about the presentation, leading to even more errors in my wording.	Projector	No
	No	2	Idk, if I had to guess I'd say it's due to having a predisposition to being disapproved	Doesn't *affect* me, as mentioned	Hands on experience	No
	No	4	Technology Failure	Start speaking not as clear	Clicker	Yes
	Yes	9	Being unprepared.	I have dropped my cards before.	Clicker, Mouse, Stylus	Yes
	No	2	I don't really get anxiety	Not at all.	Projector, Mouse, Stylus	Yes
	Yes	9	People talking whilst I present	I start to stutter	Projector, Mouse	No
	Yes	7	general anxiety	I get sweaty and forgetful.	Projector, Mouse	Yes

Are your teaching skills improved by the use of teaching instruments?	What problem do these teaching instruments solve for you?	How often do you experience technological issues and/or failure during a presentation?	How often does the reliability of your technology affect your presentation?	What could these various products do to fulfil your needs better?	What do you think would improve the design of clickers? (For Presentations/Teaching/Public Speaking)
4	It takes less time to "erase" the board.	3	4		I don't use one.
5	Keep me on track with what I want to say	2	2	It's usually a hardware issue	Sometimes too big
4	It makes the organisational process easier	3	3	N/A	Smaller
1		2	2		Maybe some sort of stress relief thing. Like when fidget cubes were trendy it would be cool if there was a useless button or trackpad or something that a presenter could fidget with to release nerves whilst still looking professional.
4		2	3		Better connectivity. Easier setup.

4	Visual images help with the speaking	3	3	Give me more no ability around the glass room/ more control	More ergonomically designed to fit the hand, buttons separated more for not to accident
2	I prefer trackpad	1	2		Ability to fully act as a mouse
2	Possibly save time running through the presentation	3	3	They can help make the presentation more engaging	Having a design that makes all buttons identifiable by touch is a big help as there's less distraction away from the audience
3	Allows the audiences focus to go somewhere else	2	4	Be less faulty	Nothing
5	Making sure I say everything required	5	5		More options on buttons
3	Not sure	2	2		Nothing
3	Audience visually can absorb information as well as through hearing and discussion	2	4	I find just being organised and well prepared with documents that can be presented to the audience.	Easy to locate buttons
3	Showcases examples easily and more engaging content.	2	2		Touchpad/mouse integrating. Drawing stylus
5	Conveying concepts effectively and efficiently	2	2		They're already ergonomically and usually have a laser pointer to address specific parts of slides, maybe if they had some kind of mouse control for clicking links without going back to the computer for example
1	They don't really, I try to use them as little as possible because they detract from the most important part of the speech, me. And they're prone to failure.	4	4	There are always some arbitrary reason things don't work like "oh you're using a mac, but this system prefers windows," or I don't have the latest version of something, so fixing the minutiae like that would help	I think they're fine as is
4	It allows me to have control whilst presenting. Ensuring that I am not just looking down at my computer when speaking to make sure that my slides are correct. Also, when explaining specific parts of my presentation I will use a stylus or a pointer to show with ease what I am talking about	2	4	Instead of having multiple devices when presenting I believe that having the one device that implements all aspects would be very beneficial to presenters in the workplace. Having to only rely on one device would ensure a smooth presentation without any technical issues. Also, this would mean that only one device would have to connect to your computer/ tablet.	You could implement a microphone into the top of it to ensure that the audience can hear you. You could also change the design to become a lot slimmer to introduce a stylus point to one end thus allowing the pointer to have various functions fir the end user.
4	I can use my device to demonstrate to my audience what I am doing.	2	2		Less awkward to hold
2	If i were to use them, they would help me convey my message more clearly.	2	2		Better connectivity
3	Not sure.	1	1		No idea!
4	They help me keep my thoughts organised	4	5		Easier setup. I struggle to set these up because they sometimes don't connect easily.
4	Means I have more control over situation and eases nervousness	1	1		Quite good already. Not many suggestions. Labels may make easier to use for some
3	They simplify the transitions between screens	2	2		Simplify setup & charging
4	Able to display data	5	5	Better connectivity and gestures when doing presentations	Better Gestural Control and better Connectivity
4	Ease if communication	3	4	Work consistently	Nit sure
4	It lets me show my students what I am doing on my laptop.	4	3		more minimal
2	I can show the people I am speaking to images and documents easily.	3	4	Easier interaction as I am partially blind and find it hard to read on digital sceans.	Larger and clearer buttons with INSTRUCTIONS.
4	Makes it clearer for others to understand issue	2	2	Fewer technology glitches is good, simpler way of finding files in mass data quickly upon request	Simple controls
3	It allows me to interact with my information and take focus away from myself	1	1	I have no issue with these products at the moment however maybe using a portable projector may be helpful as some rooms don't have one or if you wish to display the information on a different wall	Potentially more detailed buttons to do more actions if necessary
5	Help you stay focused on the curriculum or subject	4	4	Be much simpler to set up & rectify issues	Larger primary buttons and option for customized buttons
3	Not needing to speak as much	2	2		Most times lectures use these the battery is dead, or they need to point the clicker at something for it to work, so perhaps a better battery life or charging station
3	More accurate presentation	3	3	Be more reliable	Clearly different feeling forward and backward buttons

1	Nothing	2	1		Nothing
5	Being bare on stage just speaking, the equipment gives me a type or armor	2	4		If they connectivity was more secure
2	Not any really, doesn't help with my verbal communication	2	1	Don't think it's what the products can do to help me more, but more about me needing to use the products better to help with presenting.	I don't think they need improving, they fulfil their function which is a pointer/next slide button. If something was to be added to help improve the design, it would be adding more functionality to it, maybe include customisable buttons which can be mapped to various functions of the presenters choosing.
1	They don't	1	1	I don't use them to educate.	Bluetooth communication vs infrared light communication
4	Can use the clicker while i present	4	4	Better connectivity, like a failsafe for the device if it stops working	better gestural motions
5	They let me show my ideas	4	4		Not having to look at the clicker as I mistake the buttons sometimes. Maybe a raised bump or something that makes the buttons identifiable by touch.
4	help me organise my answers	4	5		laser pointer in the clicker so that I can point to what I am saying
2	multitasking and organisation	4	3		smaller design. sometimes can be too bulky
5	visually supports my presentation	4	5		improvement in battery life

What do you think would improve the design of mouse's? (For Presentations/Teaching/Public Speaking)	What do you think would improve the design of projectors? (For Presentations/Teaching/Public Speaking)
Longer range for wireless mice	Do you mean projectors?
Not sure	Sometimes block the view of the screen for some
Wireless/ use from anywhere	More stable/ sometimes get bumped and move around
Nothing, a mouse is just a bad choice for a presentation as it means you have to stand near the computer and can't move around. A clicker is the improvement of a mouse.	An auto focus feature, so that people can always see the document clearly. Or real time scanning, making text more legible.
Works on more surfaces. Increased sensitivity.	Digital projections from workspace instead of having to look down past projector blocking view.
Designed so your hand is in better position when standing i	Hard to see from behind it while writing
More functionality and programmable buttons	Able to project in well-lit up area
A mouse that could function on more irregular surfaces could be a big help during presentations as it offers a greater area of range such as handheld use while standing and presenting away from the desk	A projector that functions well in well-lit rooms. Can be hard to find affordable portable projectors that offer this.
More ergonomic grip, allows usage on multiple surfaces with need of mouse pad	Nothing
Nothing	Not sure
Nothing	Digital projector
Comfortable in hand, easy gliding	Easy to setup
Side buttons.	Drawing on paper as a stylus - marks it on screen, not on actual document.
Wireless, maybe smaller?	Backlighting or top down lighting to reduce shadows and improve focus
More buttons, like a gaming mouse but for a professional setting	I've never used one of these
Not a lot	I don't believe that you could improve a projectors main purpose. But you could always improve on the design being taller having a better light source or a better camera. This would ensure that the audience can clear see what you are presenting.
Further distance wireless connectivity	Less awkward when writing and looking at the screen
better shape for more comfortable grip over time	Work in brightly lit rooms
I don't know	These are cool!
Sometimes the mouse glitches and doesn't let me move it around.	I must turn the lights on and off over and over throughout my presentation so that my audience can see.

Specifically, designed mouse's for presentation. Wireless ones	Easier to move and focus. More compact and Bluetooth
Usable on any surface, even in air and activated by a button	better audio setup
If i didn't have to use them on a flat surface	if i could see my work on the screen and a better scanning system
Clicker attachment	To be more widely used
further connectivity	digitally stream instead of project
Easier to click and move around	more options for people with less sight
Easy glide and click, not clunky	Good strong image, easy to set up and project
A wireless mouse would be beneficial as you don't need to be in the one spot	If these were more compact as many are quite heavy and big
Not much	Better set up assistance such as guidelines for extent of sheers
Nil	Simpler settings, less temperamental
It being wireless	Never used one
Nothing	Speaker attachment
The ability to use a mouse wirelessly through Bluetooth would improve the design	n/a
Similar to the clicker, but the main issues of a mouse are it's not really good to be used during presentations.	who uses projectors anymore let's be honest? Maybe increase the quality so it's easier to see or improve stability so it doesn't shake all the time.
Replace them with precise motion trackers	Think ahead and scan the pages instead for clearer images
More overall control	Better connectivity to other documents and better scanners
increased battery life on wireless mouse	very bulky and expensive
better connectivity	digital stream on what is being written instead of projection. I don't like looking Infront of me when I am writing down.
more portable design that works on more surfaces	lighter and more portable
better battery	better sensitivity when writing in bright spaces

Transcribed Interviews

Transcript: #1 Respondents Responses

Project manager who talks to clients and the their team

What environment do you present in?

Typically what I use, when I present to either clients or personnel in the workplace: I would use mechanisms on a computer with spreadsheets to present statistics on PowerPoint displays. I use whiteboards to brainstorm with committees and participants. I will use video conferencing facilities. Pretty much the majority of it is electronic, even the whiteboards tend to be either filmed by the video conferencing or sometimes they are digital and scanned and sent across as a record of the event. As a presenter what are some pain points with your speaking? I'm not a full-on presenter. I probably tend to look back at the screen and I tend to look at the screen as a prompt for me not to forget different topics and different items.

What types of teaching instruments do you use and why do they help?

If it was a presentation like a capability statement where I knew everything yeah I use it clicker or a mouse in the same function, but typically the majority of my speaking is towards groups who are learning in group participation. So it's not something where the screen is isolated, the screen is part of the presentation. So yeah I do tend to look at the screen and pick topics out of it. Primarily I am using the presentation tools like a set of cheat notes in my hand.

What type of design changes would help you speak/teach better?

And yes I do use a laser pointer at times, but it's quite simply just an aid to stop me getting in the way of the screen. I use a clicker to change pages when necessary, but I'm better off with less devices and really simple ones at that. For example: you may wish to change the page or you may wish to click on a piece of data, but that doesn't help when you fumble around with devices - the message gets lost! For this reason I am more comfortable with a mouse. If it was a big screen and I'm standing 10 feet away, well obviously I'd use a laser pointer and clicker as it's better for the job. So you could make a laser pointer with the clicker integrated into it if you that if that makes sense if there was one available.

Do you want a product that would act with your gestures?

-
My daughter said to me when I had to present critical data on Microsoft Excel to do it on PowerPoint Dad and went about how teachers are teaching us to use PowerPoint. So you don't have to remember too much and it was pretty good. You want to engage the audience or the participants, so we speak better knowing the topics and sometimes seeing the topic on the screen. So probably not so gesticulation technology and that sort of thing. It looks fancy but I'm not that sort of a PC guy you know what my projects and what the jobs require.

Do you have any setup problems or technological failure?

Set up is the main problem every single time. We go to do one of these meetings at a video conference in the teleconference and it seems to never ever work. There's never ever a way of setting them up seamlessly it just doesn't seem to matter. Sometimes the Wi-Fi doesn't connect, the wrong cables they're just too many cable ends. Sometimes you need a special cable, hang on you need to use this, or the software doesn't go your way. The fancy equipment could easily be approved and the really good equipment is super expensive; there's no real need for it to be.

Transcript: #2 Respondents Responses

Student who does presentations

What environment do you present in?

I do university assessment most of the time and sometimes I also have to talk in front of crowds when I'm working at my retail job.

What technology do you use?

My laptop and I also use my iPad because I do a lot of sketching so I use my iPad like a slideshow.

What are the problems you face?

I get really bad anxiety so I tend to avoid the situations completely but when I'm forced into the situations for assessment. Are usually start stutter and I get really nervous I usually also forget everything that I'm supposed to be saying and I clicked the wrong slide sometimes and also if I'm using like prompts on paper or on my iPad I have dropped those before so and I forgot to order them so everything's out of order so then it was even worse and everything just always goes wrong for me especially the technology that I use for example sometimes I have a problem and they try and switch the slides but they don't know which Spider-Man Spider-Mans then I try news clicker and then usually the clicker doesn't work cos it's not connected properly so then I end up the saying the wrong thing with each slide.

How would you make clickers better?

Specifically Clickers when I use them ID say easier like make the buttons easier to identify without having to look at them. I sometimes don't know which button is which without looking down and then I lose my thought during my presentation so then mistake what I'm saying.

If there was a way to make it make the design more comforting so it would help your anxiety would that be a sort of product that you want?

If there was a product that we're reduce my anxiety for presentations I would definitely use it. I hate presentations.

Specifically what are these reliability issues With teaching instruments technology ?

See you said that you'd like to use a laptop a lot is there a way to make this product better in terms of teaching or presenting for me I am in student so I don't really rely on the hardware so much but if there was a software element that would help me I think that would be a lot more beneficial for my line of work and presentations for example 1 presentation recently that I have done was purely on my iPad and it was a prototype for an app but the application that I was using would not start during a presentation so I couldn't demonstrate my work and I had to just talk about it so if there was a way to improve this reliability it would definitely help

If there was a clicker that you could plug into your computer that had better connectivity so you could access your documents through the Clicker so you can access like a USB would that help with your problem ?

I think if the product allows me to use different software software's with different platforms and like computer versions that would be good you will just have to make sure that it was like universal because not everyone uses the same software so if it was able to carry those different files than yes it would be good

If the clicker could access like Visual Studio coding software and you could show on the screen like moving elements and stuff like that or doing like charts would that help?

It was along the line of that then that would be good you would just have to make sure you take into consideration all of the software's that is out there and for professionals.

A someone who doesn't use clickers a lot would be a simplified version of a clicker that is not as complicated or like a mouse that could act as a clicker, would that be more beneficial for you?

As someone who doesn't present' often in general I feel like something not necessary not necessarily a clicker not necessarily a clicker product for hardware something that is more like easier to access for everyone so maybe I don't like an app on your phone and you can make use it as a clicker that would be more easier for me causes it's something in it as well I don't have any money sorry it be more accessible for everyone it would also like to take into consideration like it already has the Bluetooth and connectivity there so you don't need to worry about that it's more so just like it sorry in your hands so everyone already has one so you would just need a developed the software like I know the Apple does that they have a an app that you can download and use it as a remote instead of like if you lose the remote you can choose your phone and so it probably works better for more people than having a physical clicker and also it's familiar technology so its better cause people know how to use it.

Transcript: #3 Respondents Responses

University student

What type of environments do you usually do presentations in?

So usually do presentations in tertiary controlled class will we have the appears students and tutors and then a head lecture so usually I do from 5 to 15 minutes presentation when will we have a focus group but the majority are in a class of 8- 10 students.

What types of Technology do you use?

Usually the format a presentation which most cases I use my laptop or the university provided computer with your computers on Trusses you also may use a wireless mouse if we organise enough but that's as far as it goes

What are the problems you face with a wireless mouse?

When using wireless mouse is often the ergonomic office kind of big bulky holding your hand if it's ok when it's on a stable surface but we just holding it in your hand it feels a bit sizeable most cases the functionality works perfectly yeah To the mouse you have a quite a big range usually you're not more than 2 m from where you actually presenting so the have must must have about 5meters radius from the from the USB for the department the functionality would use them for long enough and now they work very well with PowerPoint and other forms of media and presentation for something a bit more mobile to use that kind of stay stations I feel like clickers you get lost in the presentation like that last with consideration is the price the price point of a mouse is cheap.

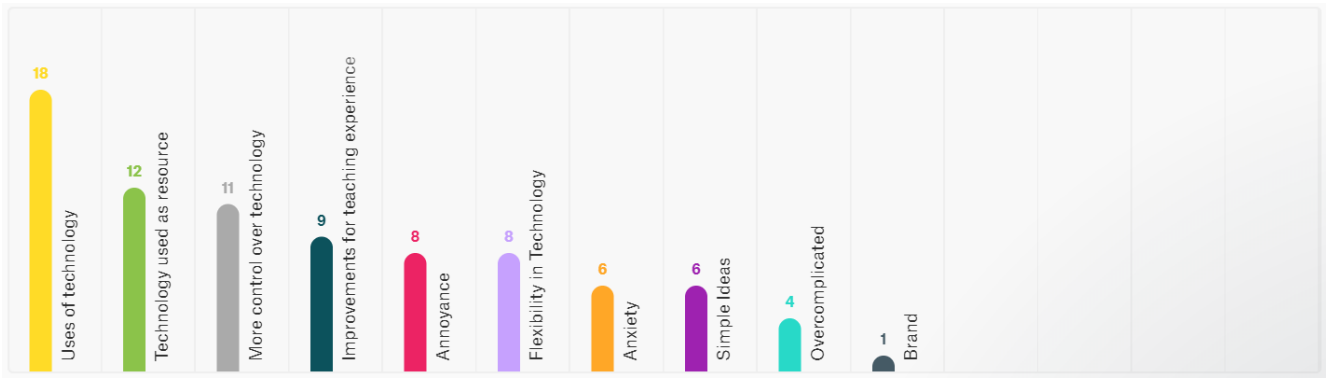
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What happens if something like technological failure happens how does this affect your speaking?

I will use different types of technology as backups . With presentation what you can do is often rely on having like the backups of my of my data or two had to learn you were putting it on on the USB and then being able to just move it to another computer use another computer for it actually helped the problem and and also sometimes I carry just print out paper and

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Design |

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A collection of sticky notes with various labels such as 'Uses of technology', 'More control over technology', 'Annoyance', 'Simple Ideas', and 'Overcomplicated'.

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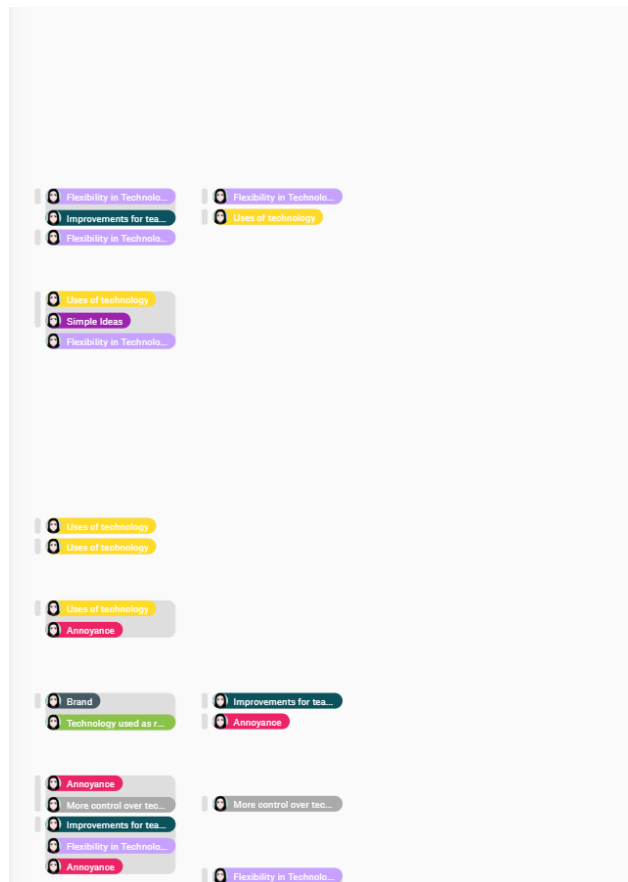
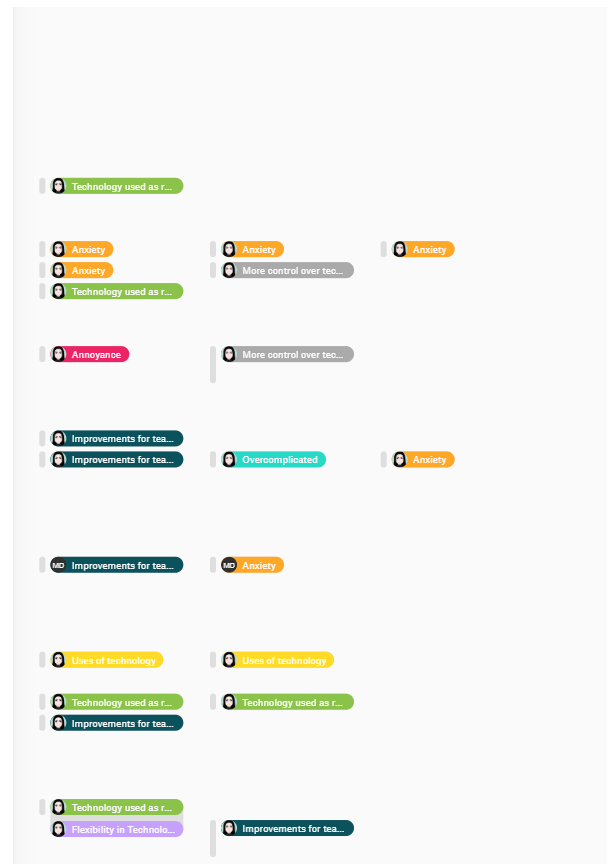
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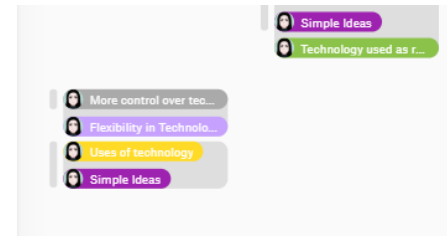
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