



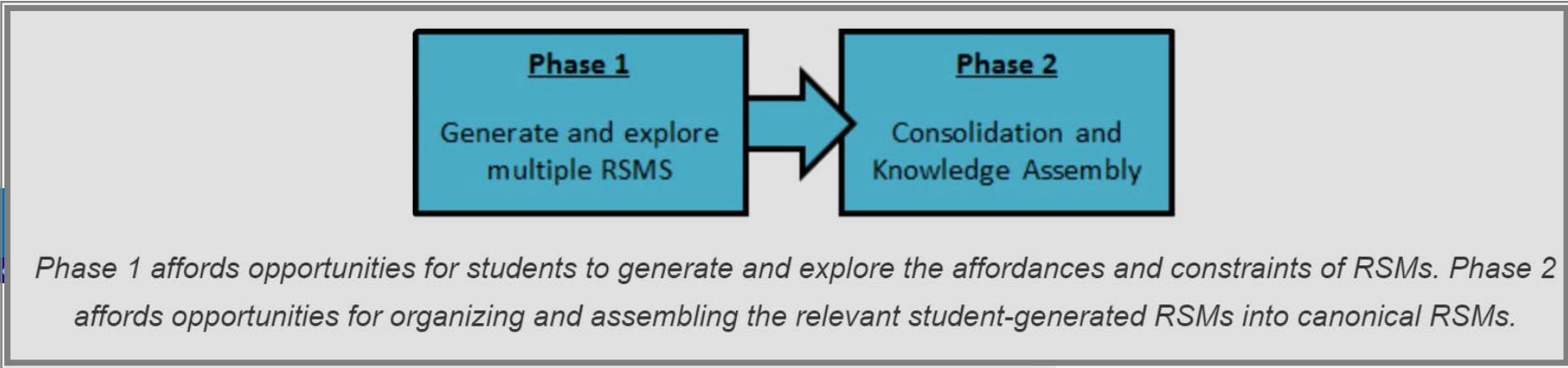
Leveraging Productive Failure for Adult Learning

(Translating principles to action)

INNOVATION CENTRE

Ver 1

What is Productive Failure?



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Original Articles

Productive Failure

Manu Kapur

Pages 379-424 | Published online: 07 Jul 2008

[Download citation](#) <https://doi.org/10.1080/07370000802212669>

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Abstract

This study demonstrates an existence proof for *productive failure*: engaging students in solving complex, ill-structured problems without the provision of support structures can be a productive exercise in failure. In a computer-supported collaborative learning setting, eleventh-grade science students were randomly assigned to one of two conditions to solve problems in Newtonian

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In this article

FAILURE AND STRUCTURE

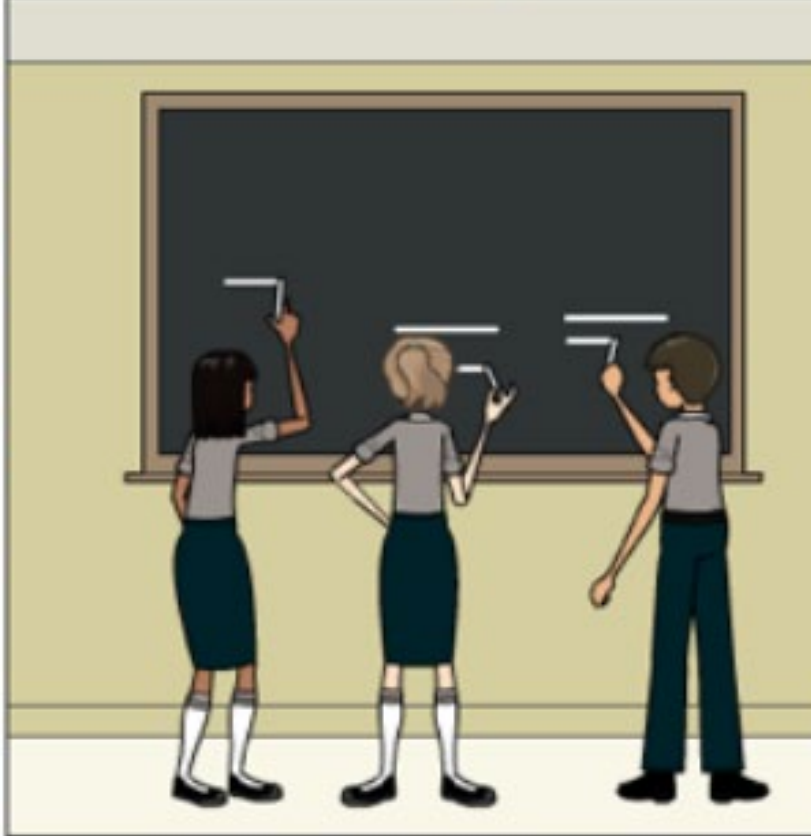
STRUCTURE AND CSCL

Problem solving



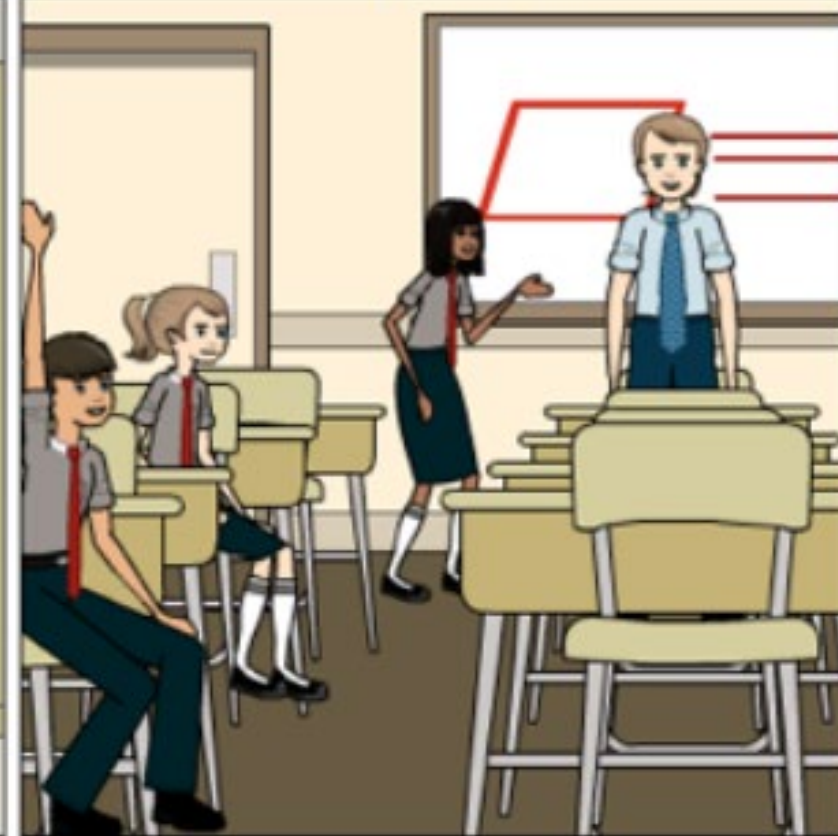
While students receive minimal scaffolding from the teachers during the problem solving process, teachers will provide affective support to get students to persist in their problem solving.

Sharing



After 80 minutes of problem solving with their group mates, students' solutions will be shared with the class, either through student presentation or through the teacher.

Explaining



Via the sharing, the teacher then builds on the students' solutions and compare and contrast them to the correct one. The teacher then explains why and how the features are different.

Mind the hand holding, stretch your learners, lead the consolidation

Adult Learners with Skills and Expertise to build on

expert-dominated ways → expert enabled learning designs

Move away from

Direct instruction

Presentation

Drill and practice, Didactic QnA,
Demonstrations

Too much feedback/ hand holding

Move towards

Co-creation of epistemic knowledge/ deep learning
experiences

Immersing learner in the problem,


Experiential learning

Trial and error, reflection, followed by instruction

Self- directed learning = learning agility

Published: 14 May 2019

Productive failure as an instructional approach to promote future learning

Naomi Steenhof , Nicole N. Woods, Pascal W. M. Van Gerven & Maria Mylopoulos

Advances in Health Sciences Education **24**, 739–749 (2019) | [Cite this article](#)

1937 Accesses | 12 Citations | 15 Altmetric | [Metrics](#)

Randomized Controlled Trial > Nurse Educ Today. 2021 Jun;101:104871.
doi: 10.1016/j.nedt.2021.104871. Epub 2021 Mar 17.

Measuring the impact of productive failure on nursing students' learning in healthcare simulation: A quasi-experimental study

Evelyn Palominos ¹, Tracy Levett-Jones ², Tamara Power ², Nadine Alco ³, Roberto Martinez-Maldonado ³

Affiliations + expand

PMID: 33773221 DOI: [10.1016/j.nedt.2021.104871](https://doi.org/10.1016/j.nedt.2021.104871)

Abstract

Background: Previous research suggests that making errors in a non-threatening simulated environment can facilitate learning. Productive failure, which combines problem-solving tasks followed by instruction, enables students to learn from making mistakes. This teaching approach has demonstrated improved learning outcomes such as explanatory knowledge and transfer of knowledge compared to a direct instruction approach where students receive instruction prior to problem-solving tasks. However, no previous studies have examined the impact of productive failure on nursing students' learning in manikin-based simulation.

Objective: To measure the impact of productive failure on nursing students' declarative knowledge, explanatory knowledge, and transfer of knowledge compared to a direct instruction approach in a paediatric closed head injury simulation.

Methods: Second year undergraduate nursing students (n = 349) from one Australian university were

Productive Failure in Higher education and Doctorate programs

Productive failure is an instructional approach that requires learners to struggle as they work on problems before, rather than after, receiving direct instruction. Productive failure is a concept. Studies demonstrate that productive failure prepares students for later learning of new, related knowledge. Our study explored the effectiveness of productive failure as an instructional intervention in health professions education with respect to (a) acquisition and application of a novel concept, and (b) learners' preparation for future learning of new, related content. Forty year-one students enrolled in the Doctor of Pharmacy program at the University of Toronto were randomly assigned to a productive failure (i.e. attempt to generate solutions before receiving instruction) or direct instruction only learning condition. After a practice phase, participants completed a series of tests designed to measure knowledge acquisition, knowledge application, and preparation for future learning (new learning is required for successful problem solving). As expected, no difference in performance was seen between participants on the acquisition and application tests. However, participants in the productive failure condition outperformed those in the

Who's involved?



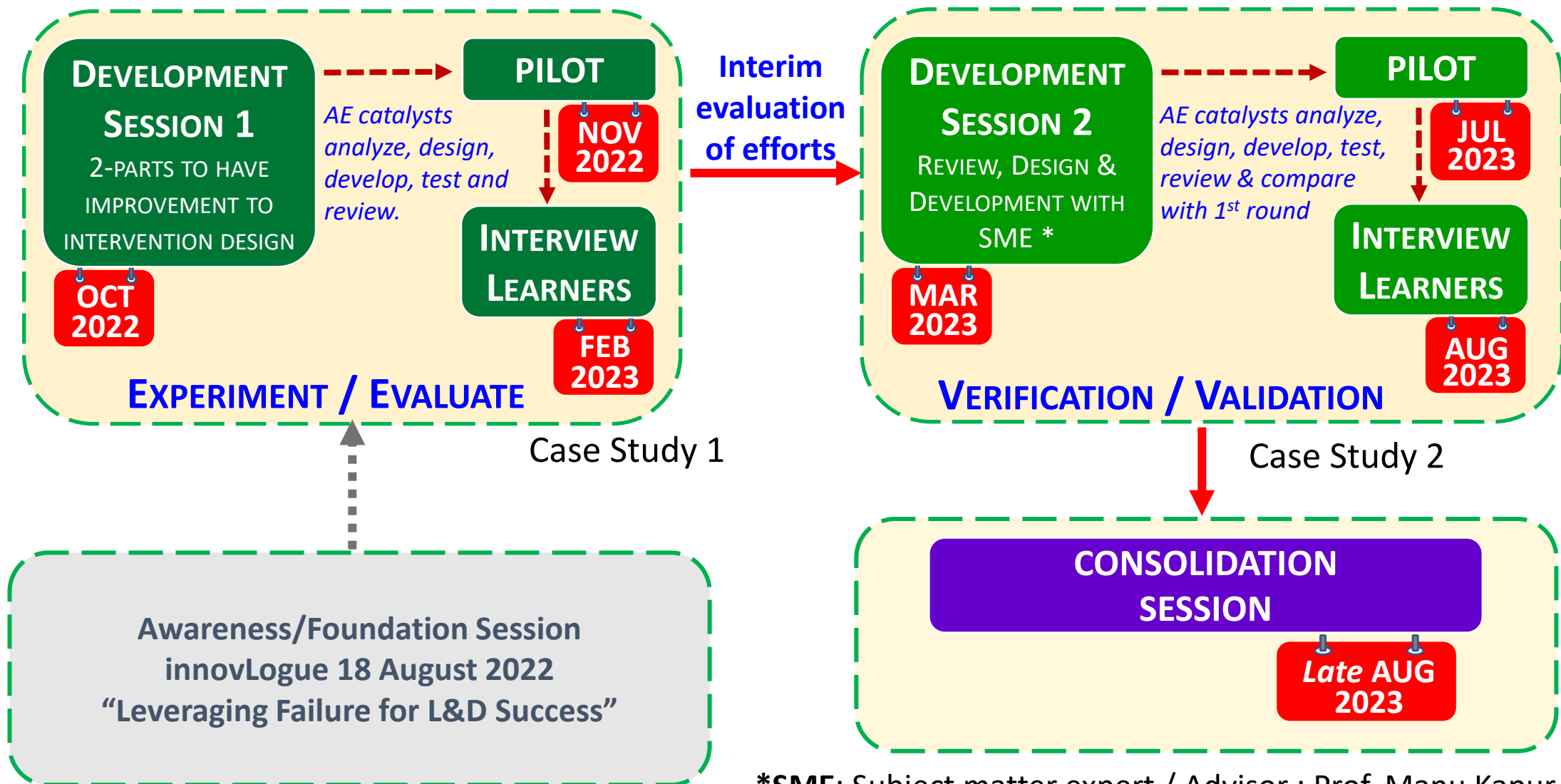
Adult Educators



Prof. Dr. Manu Kapur

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- Director, The Future Learning Initiative
- Founding Chair, The ETH Zurich-EPFL Joint Doctoral Program in the Learning Sciences
- www.manukapur.com

PROJECT PLAN FOR LEVERAGING PRODUCTIVE FAILURE FOR ADULT LEARNING



*SME: Subject matter expert / Advisor : Prof. Manu Kapur

What are we looking for?

Eight diverse case studies to yield rich insights

Diversity to be based on:

1. Spaces for learning, e.g., classroom, online, workplace and hybrid/blended.
2. Nature and types of learning outcomes.
3. Learner profile / segment, e.g., older workers/learners, career switchers, upgraders.
4. Types of learning contents (e.g., generic skills; hard skills; technical skills);
5. Types of industry where the learning takes place; and
6. Any other info / details deemed pertinent.

Who are we looking for?

Experienced Adult Educators with sound foundation in learning and teaching...

1. At least 5 years of experience in designing, developing, **and** delivering curriculum, lessons as well as assessment for adult teaching and learning.
2. Currently active in adult learning design, curriculum development, delivery and/or assessment with corresponding qualifications and credentials.
3. **Have on-going classes** (*preferably outside of IAL*) where learning interventions can be introduced and trialled for the duration of the project.
4. You would be at an advantage if you actively, explore learning innovation, adapt innovative and learning sciences informed pedagogical practices in your teaching and learning.

Adventurous Adult Educators who are not afraid to try and fail... and want to talk about it

- **Design learning experiments** using PF principles for one of their classes
- Produce case studies on their learning experiments which include **documenting learning journey**, iterations of PF interventions, learner artefacts and reflections
- **Co-develop** the new andragogical approach
- **Time, commitment** and resources to the project. And **its duration**.
- Analyse, write and produce case studies on the **learning interventions** that he/she has developed and trialled, regardless of the outcomes of the trials, which would include **documenting the learning journey**, iterations of PF interventions, learner artefacts and reflections- based on the case study template, provided.

Which classes to choose/ avoid.. Some guidelines... *(no hard and fast rule)*

1. Avoid WSQ courses
2. Avoid milestone classes, like a capstone class
3. Avoid those with summative assessments and regulatory compliance requirements
4. Avoid classes that involve licensing from other agencies & many different governing bodies- choose straighter courses
5. Feel free to propose tech enabled, blended classes, workplace learning, skills based (technical or soft skills)

Program Timeline- refer to webpage for the most updated one

LEVERAGING 'FAILURE' FOR L&D SUCCESS

18 AUG
3:00 - 5:00PM

**HYBRID
SESSION**

Lifelong Learning Institute #05-03 S408601
or online via Zoom



**Professor
Manu Kapur**
ETH Zürich



**Professor
Michael
Jacobson**
University of Sydney






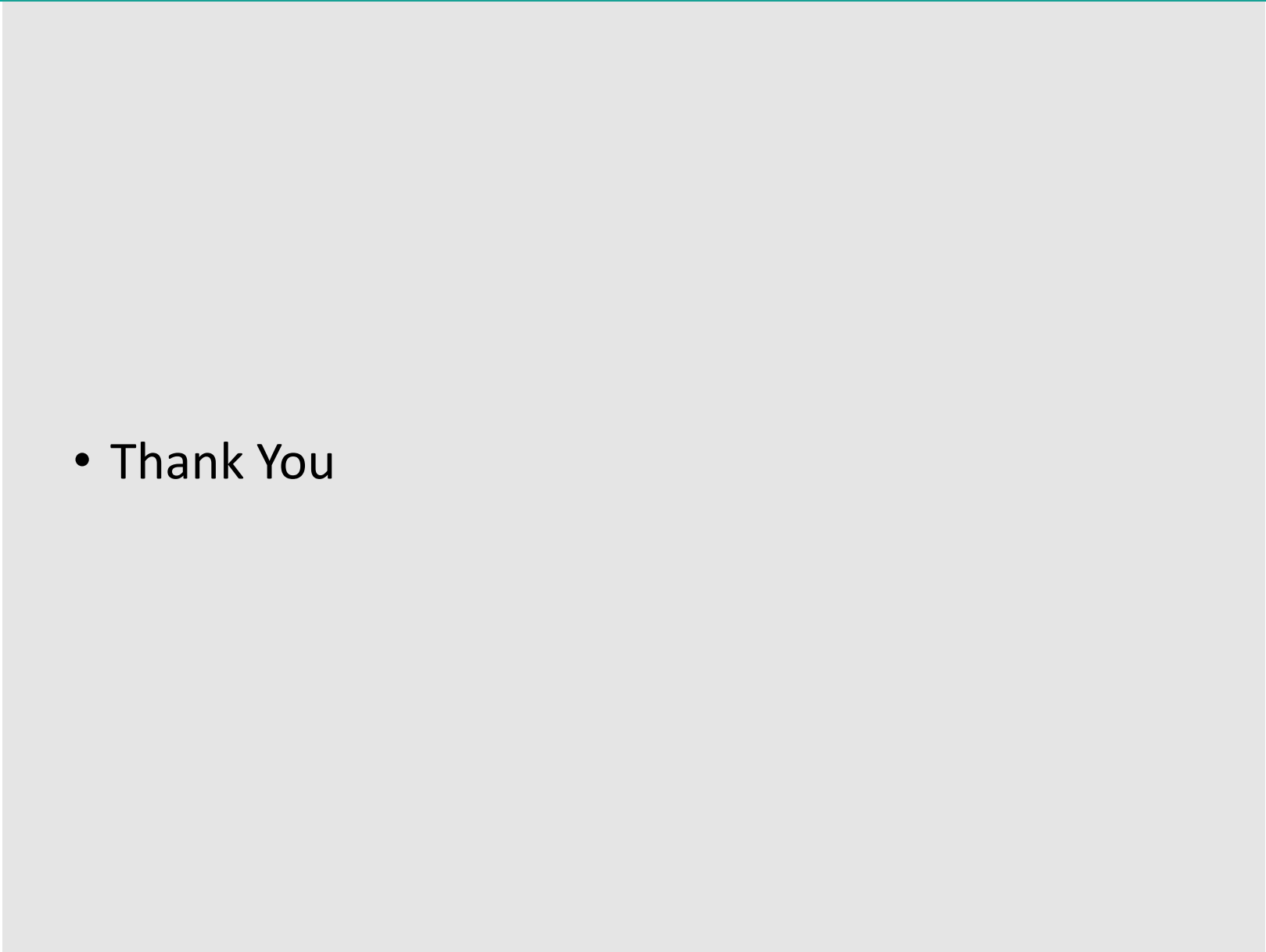
**Dr Parveen
Sandhu**
Surge Consulting



MODERATOR
**Dr Michael
Choy**
Tech Tree

References

<https://docs.google.com/document/d/1sTdrRKughFOl03e1OCaynhYSD-e3kUxz5hxnHuWQxJ0/edit?usp=sharing>

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- Thank You