

Using Top Hat in Engineering Management lectures

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What was the pedagogic challenge?

The pedagogic challenge in this project was to incorporate the audience response system **Top Hat** in the lectures of the Engineering MSc module of Lean Engineering with the overall goal to enhance student comprehension and engagement.

The main project objectives were to:

- Make students engage more in lectures
- Enhance students' comprehension of the material
- Help students realise causes of possible mistakes they could avoid in the future
- Constructively integrate the use of Top Hat in the learning process

What is Top Hat?

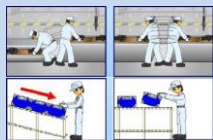
Top Hat is an **audience response system (ARS)** using a mobile application and an online platform.

The instructor can create various types of questions in the online platform which can be then answered by the students through the Top Hat application installed on their mobile phones.

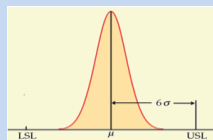
Students can also see the results of the question in real-time and compare their answers with their peers'.

How was Top Hat used?

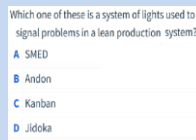
Top Hat was used in 4 different occasions with various kinds of questions (multiple choice, numerical answer / word answer with no options available, click on target) presented and answered by students real-time in class. Representative question samples concerned:



Lean tools –
Standard work
(click on preferable way)



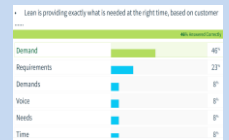
Quality Control –
Process Capability
(numerical answer)



Lean Concepts
(multiple choice)

		0.35	0.30	0.25	0.20	0.15
		CONCORDANCE SCORES				
G(IAR)		0	1	0	1	0
G(IAC)		0	0	1	1	1
G(IRA)		1	0	1	1	1
G(IRI)		1	0	1	1	1
G(ICA)		1	1	0	0	1
G(ICR)		0	1	0	0	0
	A	---	0.50	0.50	---	---
	B	0.30	---	0.70	---	---
	C	0.70	0.70	---	---	---

Value Analysis
- Concordance matrix
(click on errors)



Lean Concepts
(free choice of answer)

Evaluation

In order to evaluate the effectiveness of using Top Hat in lectures, a questionnaire was designed and issued to the students. In total, 12 responses were received.

In order to evaluate the validity of the responses, students were asked how many lectures with Top Hat use they had attended. The results indicated that 75% of the class were present in all lectures where Top Hat was used with 100% of the class being present at the 4th use of Top Hat.

	Questionnaire Statement	Agree & Strongly Agree	Neither agree nor disagree	Disagree & Strongly Disagree
Q1	I found Top Hat easy to use (disregard the initial doubts about the license)	100%	0%	0%
Q2	The use of Top Hat made me engage more in the lecture	100%	0%	0%
Q3	Anonymity was an important motive for me to participate in the polls	92%	0%	8%
Q4	Top Hat was useful for clarifying parts I had not understood well	100%	0%	0%
Q5	Top Hat was useful for realising causes of possible mistakes and avoid them in the future	92%	8%	0%
Q6	Overall, I think that the use of Top Hat was a useful addition to the module's delivery	100%	0%	0%
Q7	I would be positive for the frequent use of Top Hat in (any) class	92%	8%	0%

Conclusions

Despite the small sample size, the results of the questionnaire analysis support that Top Hat made students engage more (Q2). The results indicate that the anonymous nature of the tool played an important role in that (Q3). Top Hat also contributed to the students comprehension of the material (Q4 and Q5). Furthermore, all students found the use of Top Hat easy (Q1) and a useful addition to the lecture (Q6) suggesting that its use was not at the expense of the learning process. Finally, the majority of students would like to see Top Hat being used more often (Q7) suggesting that its use was perceived as a positive student experience.