Audience response systems

Definitions, examples, usage, and results

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ACTIVE LEARNING THROUGH IMPROVED INTERACTIVITY

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What systems?

- Various names include:
  - *Audience/Student/Classroom response systems*
  - *Personal response systems*
  - *Clickers*
  - *Wireless keypad response systems*
  - *Electronic response systems*
  - *Classroom communication systems*

- Most commonly used
  - *Classroom response system*
  - *Audience response system*

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History

- 1960s and 1970s
  audience evaluations of movies prior to their release
  anonymous voting in corporate meetings - *The Consensor*

- 1990s
  Rice University in in Houston, Texas – „Networked Classroom” with basic ARS functions

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History

- 2000s
  - Microsoft Mouse Mischief – multiple mice on a single computer
  - Clickers/keypads with infrared (IR) and radio frequency (RF) communication
  - Cell phone-based systems

- Smartphones
  - Web based systems, Internet

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Today

- Kahoot
- Socrative
- Mentimeter
- Poll Everywhere
- NetClick
- VotApedia
- i2Vote
- iClickers
- i-SIDRA
- Quizizz
- GoSoapBox

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What do ARS enable?

- From a technical perspective:

    1. A teacher **asks** students a **question** (ABCDE, image select, textual answers or diagrams/drawings)

    2. Students **answer the question** using their devices – clickers, laptops, smartphones, tablets

    3. Software on the teacher's computer may show answers

    4. The teacher may change his teaching based on the results

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Benefits of using ARS

- From a pedagogical perspective:

1. promote interaction between students and teachers
2. increase students' attention levels
3. promote involvment by allowing anonimity
4. improve student learning/retention (retrieal based learning)
5. give feedback about teaching effectiveness
6. verify attendance
7. create interactive learning environments in a simple and cheap way

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Especially in large enrollment classes

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Disadvantages of using ARS

- Time-consuming

  - mastering the ARS

  - preparing materials for the class

  - waiting for students to submit their answers

  - reacting to their answers or questions

- Technical problems

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Results – learning outcomes and attendance

- Jones et al. showed that clickers can **improve assessment**, **increase attendance** and interaction, and provide a media-enriched environment to nursing students
  https://doi.org/10.1016/j.teln.2008.06.001

- Mayer et al. indicated that higher education students in educational psychology who **used ARS** to answer questions were **more cognitively engaged** during learning and **scored better** on course exams than those who did not use ARS technology
  https://doi.org/10.1016/j.cedpsych.2008.04.002

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Results – help focus and maintain attention

- Immerwahr showed ARS can be used to help **re-engage students after their attention fades** during a philosophy lecture course, improve the attitudes and stimulate discussion among students
  https://doi.org/10.5840/teachphil200932326

- Cain et al. used ARS to improve student motivation and attention
  https://doi.org/10.5688/aj730221

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Results – alleviate anxiety

- Stowell et al. analysed how a group of psychology students **answer to controversial questions** and observed that students who often experience anxiety are more **comfortable using ARS** than raising their hand in class.
  https://.doi.org/10.1080/00986281003626631

- Patterson et al. showed the importance of **responding anonymously**, validation of answers and providing **immediate feedback**, and clickers' ability to and increase student engagement
  https://doi.org/10.1016/j.nedt.2009.12.008

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Results – a safe learning environment

- Hood showed how ARS can be used to **create safe learning environments** and an open atmosphere for discussing religious subject matter

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Typical issues

- Bad time management
- Writing effective questions
- Changing lesson plan „on the fly”
- Leading class-wide discussions can be challenging

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Typical usage scenarios

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Poll, discuss, repoll method

- If the answer a question is 70% or higher correct
  you briefly discuss why it is correct and you go on

- If the answer is 30 - 70% correct
  you don't tell them the correct answer, you ask them to turn to a neighbour who had a different answer and discuss, then repoll the group

- If the answers were <30% correct
  teach the content again and revise your strategy for how this was taught

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Discuss, poll

- Pose a question
- Let students analyze it in small groups before answering it using ARS

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Poll, poll, poll

- Micro-contests or summative/formative assessments
- Pose multiple sequential multiple-choice questions

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Open-ended questions

- 1-3 questions per 45 minutes of lecture
- Award bonus points for meaningful answers
- Encourage and read different answers

- Anonymity encourages answers but comes at a price

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Conclusion - ARS

+ Can be a powerful tool to assist classroom learning
  - motivation
  - engagement
  - interaction
    - → learnig outcomes

- Cost time to prepare, solve technical issues, discuss results

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THANKS!

Any questions?

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