Examining Interactions in STEM Web Broadcasts
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Aim
To investigate the impact of embedded interactive tools (widgets) in live web-broadcasts on learning.

Context
Inquiry and experiential learning are key pedagogical methods in STEM curricula. As part of the OU’s supported opening learning approach, lab-based broadcasts provide online and distance students an opportunity to observe and engage in practical science demonstrations through synchronous (real-time) methods.

Interaction is crucial to maximise student learning. Empirical data (Martin, Parker & Deale, 2012; Kim, Kim & Han, 2013) suggest that synchronous media:

- Add value to learning through real time discussions
- Provide instantaneous feedback
- Enhance student connectedness, interest and engagement

There remains a gap in the type of pedagogical strategies that promote interactivity in synchronous environments.

Lab-based Broadcasts vs. Online Tutorials

<table>
<thead>
<tr>
<th></th>
<th>Stadium Live Lab-Based Broadcasts</th>
<th>Adobe Connect Online Tutorials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>~ 10 - ~ 100</td>
<td>~ 5 - 25</td>
</tr>
<tr>
<td>Focus</td>
<td>lab-bench experiment field</td>
<td>whiteboard shared screen</td>
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<tr>
<td>Interactive Techniques</td>
<td>pre-prepared Q&amp;A widgets, chat box</td>
<td>on-screen activities, polling, raise hand, applaud, chat box, microphone</td>
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<tr>
<td>Instructional Strategy</td>
<td>situated presentation</td>
<td>dialogue</td>
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<tr>
<td>Motivational Factors</td>
<td>curiosity excitement companionship</td>
<td>support isolation learning</td>
</tr>
<tr>
<td>Technology</td>
<td>multiple HDI cameras, video mixing desk</td>
<td>restricted camera on device</td>
</tr>
<tr>
<td>Logistics</td>
<td>production team, presenter and assistant</td>
<td>tutor and assistant</td>
</tr>
</tbody>
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Approach

Observations
- Teaching practice
- Video content analysis

Surveys
- Stakeholders attitudes & perceptions

Tests
- Instructional strategies
- Pre test/post test

Draft Research Questions

The study will address the following areas:

i) Ways collaboration happens between students and presenters.

ii) Adaptations to encourage equality of knowledge development.

iii) Perceptions of stakeholders (i.e. students, lecturers and production teams) on live web-broadcasts.

Figure 1. Schemata of live-stream web-broadcast

Areas of Investigation
- Social Presence
- Student Motivation
- Interactivity
- Effectiveness
