

Motivation

Educators can be more effective when supported with orchestration—the management of learning activities.

Orchestration is Flawed

Technology-driven orchestration is challenging [1] and, arguably, ad hoc.

It is multi-faceted and not standardised.

Proposed Solution

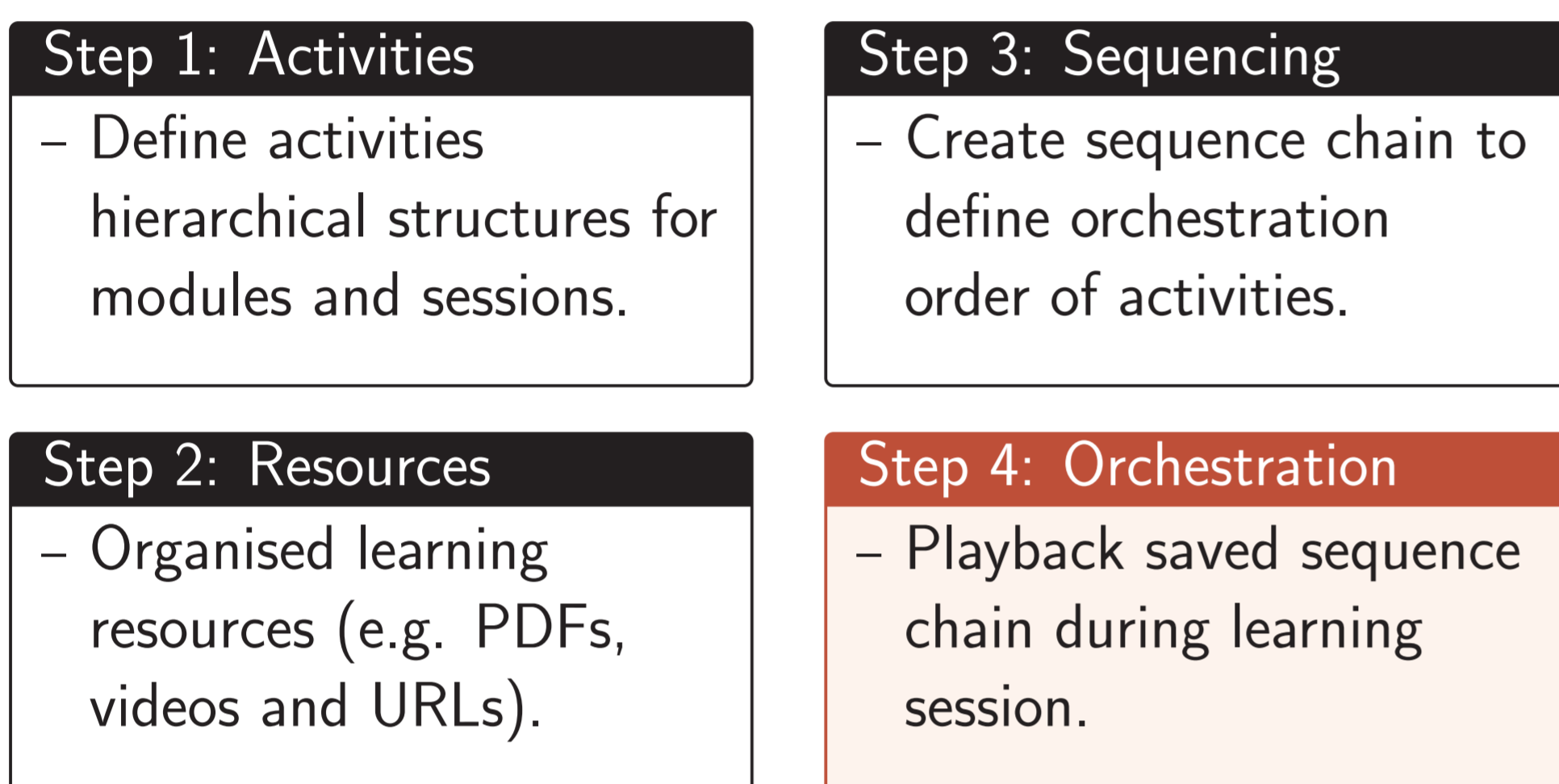
Streamline orchestration by facilitating organisation of learning activities.

Organisation could lead to effectiveness.

Streamlined Orchestration Workflow

Streamlining orchestration takes the form of a software orchestration workbench which facilitates the integration and centralised access to tools and services required to orchestrate learning activities.

Orchestration workflow procedure involves four steps.



Pre-session management is performed in steps 1–3 and session management is performed in step 4.

Study 1: Orchestrating a Flipped Class

Flipped class case study conducted using prototype Workbench to assess approach in authentic educational setting [4].

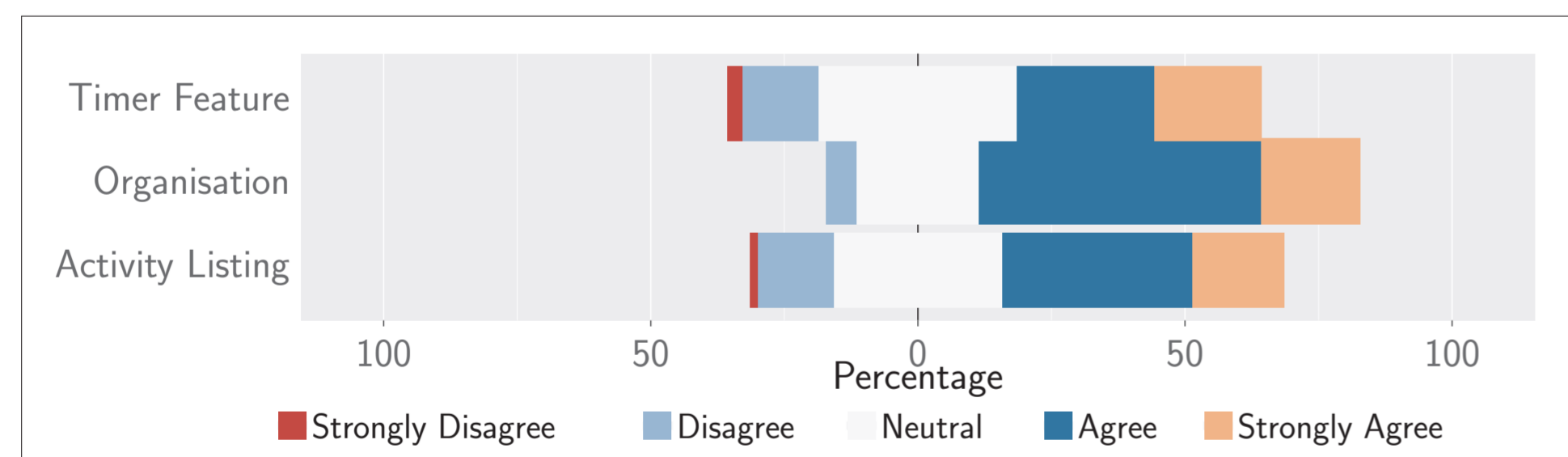


Figure 1. Learners' Experience Survey Results

Noticeable neutral flow of activities and potential positive effect on learners' learning experience.

Study 2: Peer-led Guided Orchestration

Controlled study involving 24 Tutors, for first year Computer Science courses, aimed at measuring orchestration load.

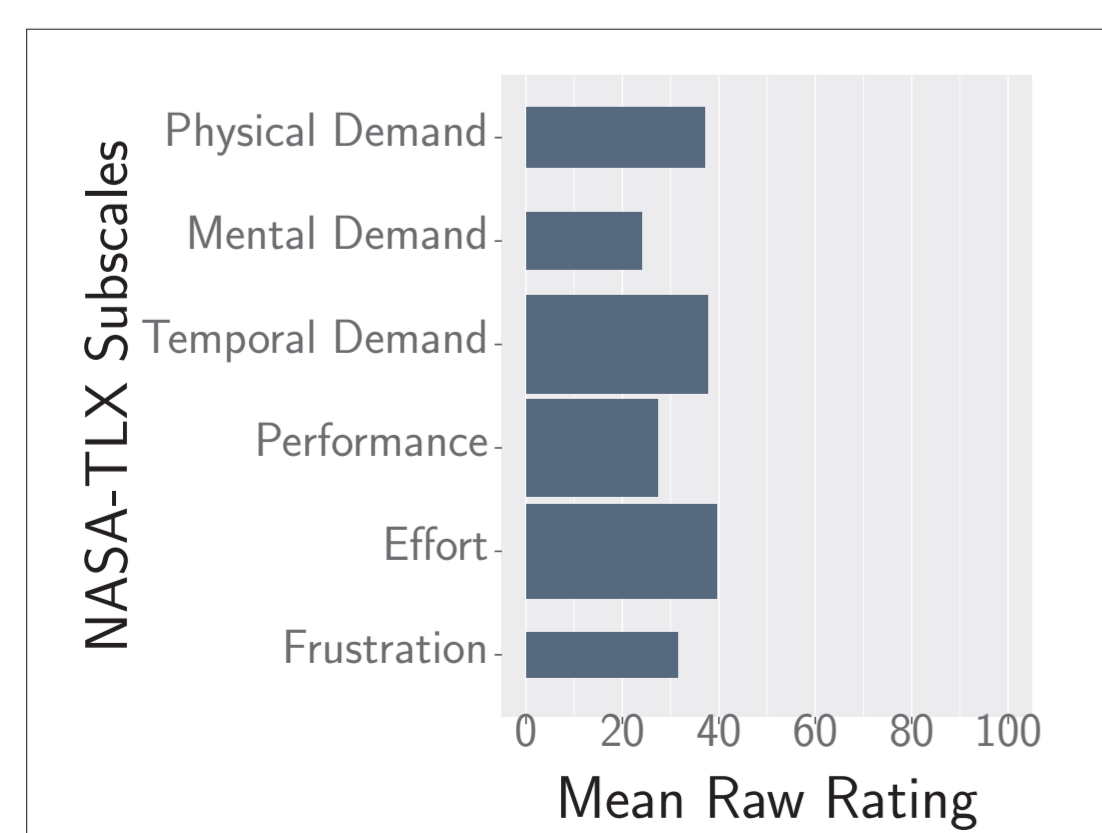


Figure 2. Sequencing Workload Ratings

NASA-TLX used to measure orchestration load.

- High values imply high workload.
- Width of bars reflects importance of weight.
- Height of bars represents magnitude of rating.

Results suggest minimal workload requirement during scripting.

Study 3: Ad Hoc vs. Organised Orchestration

Controlled study conducted with 61 educators in order to compare ad hoc orchestration and organised orchestration [3].

- Workbench prototype UI simulated organised orchestration.
- PortableApps simulated ad hoc orchestration.

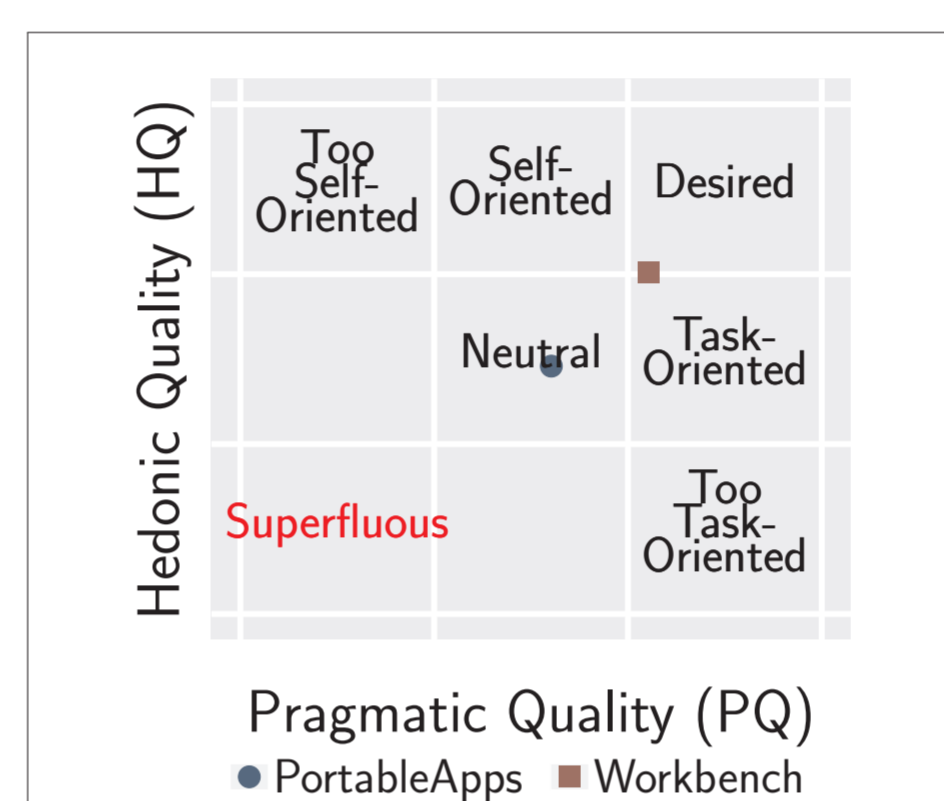


Figure 3. Portfolio Presentation

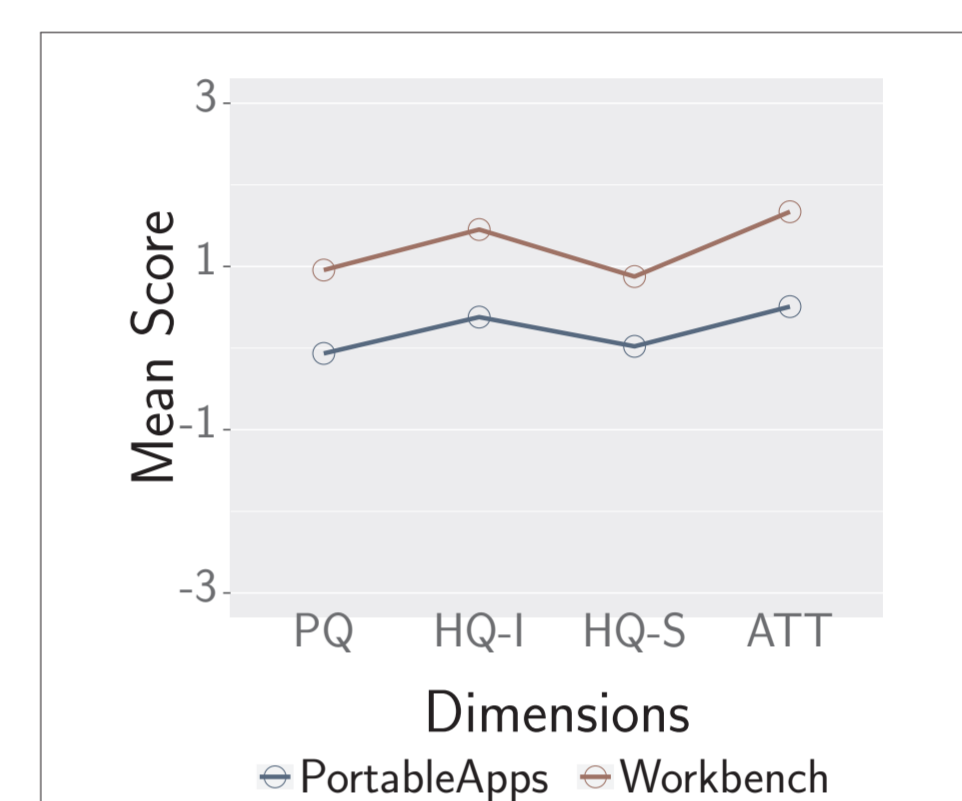


Figure 5. Dimension Means

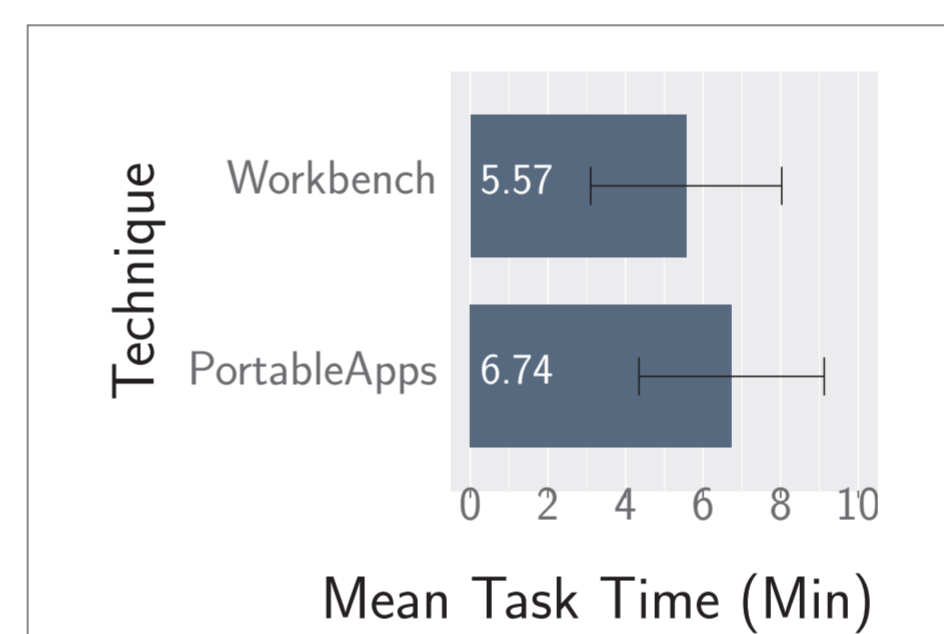


Figure 4. Time on Tasks

AttrakDiff 2 used an measurement instrument.

Organised orchestration is:

- Desirable and 21% faster.
- Correlated with improved user experience.

Organised orchestration more effective than ad hoc.

Study 4: Reusable Orchestration OERs

Practical usage scenario assessed through implementation of reusable virtual orchestration appliances (rVOA) [2].

- rVOA player: Flexible offline UI workflow component.
- rVOA repository: Scalable online repository platform.

Feasibility of integrating orchestration packages with OERs.

Acknowledgements

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Bibliography

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- [2] Parker, N. and Valentyn, M. Reusable Virtual Orchestration Appliances. Retrieved from <https://goo.gl/qNOF7V>
- [3] Phiri, L., Meinel, C., and Suleman, H. Ad hoc vs. Organised Orchestration. In *8th IEEE International Conference on Technology for Education*. December 2016.
- [4] Phiri, L., Meinel, C., and Suleman, H. Streamlined Orchestration. *Computers & Education*. 95:231–238, April 2016.