

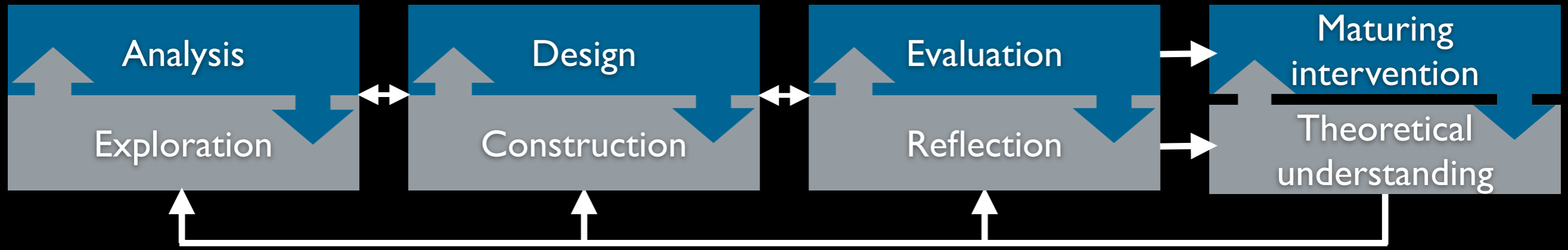
The Collaboration-Authentic Learning-Tool Mediation Framework as a Heuristic to Design, Use and Evaluation Learning Activities

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Research presented is concerned with the professional development of academic members from a South African University in the use of technology in their teaching, learning and assessment practices.





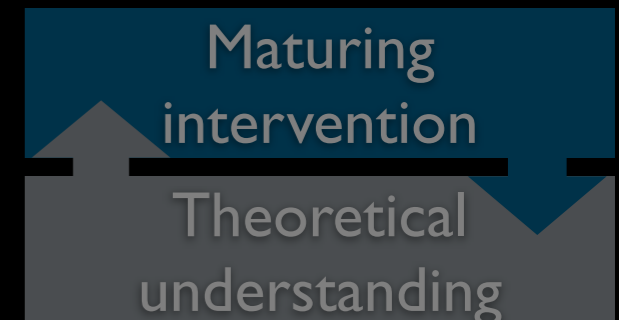
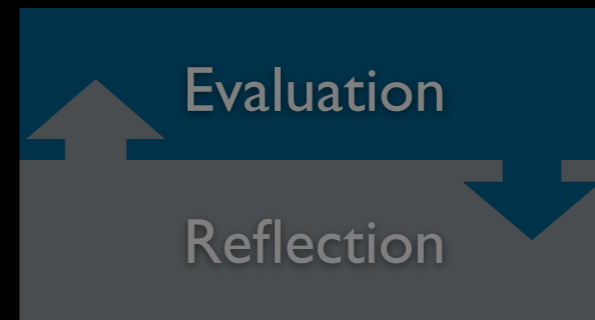
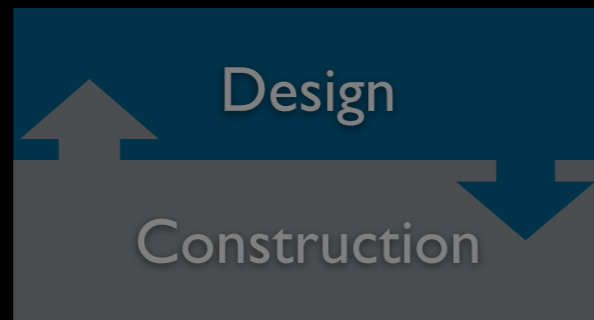
- At UJ:
 - Learning conceptualised as becoming a practitioner of a knowledge and professional domain
 - Information-oriented (recitation of information) approaches limit optimal learning
 - ICT should extend contact teaching in innovative and digitally rich ways



- But prior to 2012
 - Professional development in the use of ICT in teaching, learning and assessment was limited to training
 - A learning *from* technology approach
- Therefore
 - Development of a new framework
 - A learning *with* technology approach



- Framework built of core concepts of CHAT
 - Social collaboration
 - Tool mediation
- And
 - Authentic learning as the object of the activity



Collaboration

- We learn from each other
- Social media connects us
- Together we create new ideas, connections and products
- Course facilitators create environments for social interactions

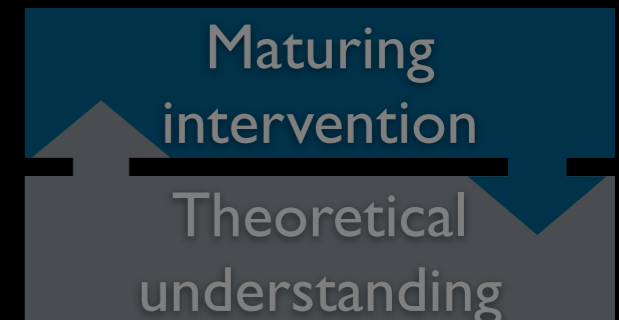
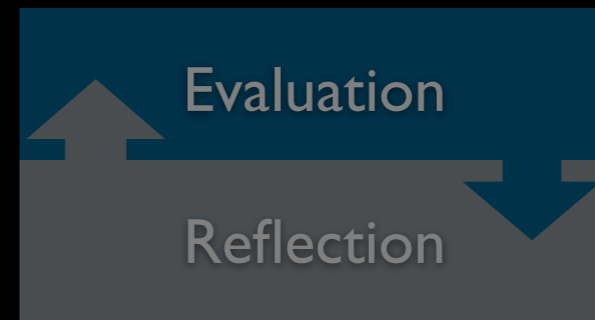
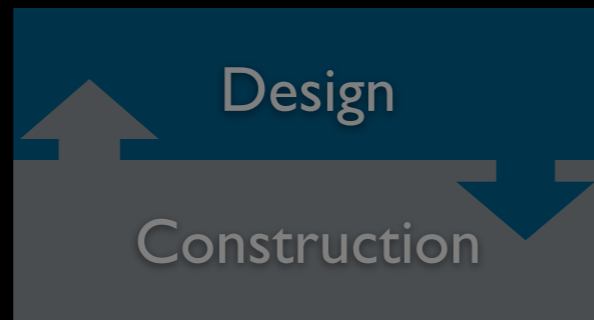
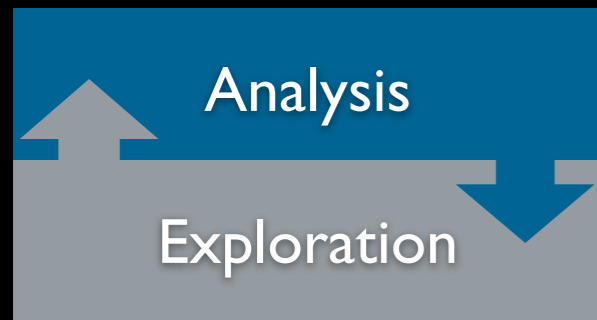
Tool/Technology Mediation

- Information stream
- Enabler of communication
- Empowering collaboration
- Information transformation tool
- Professional tool



Authentic Learning

- Have real world relevance
- Are ill-defined
- Are complex
- Different perspectives
- Collaboration
- Includes reflection
- Integrates different subjects
- Integrated assessment
- Polished products
- Competing solutions



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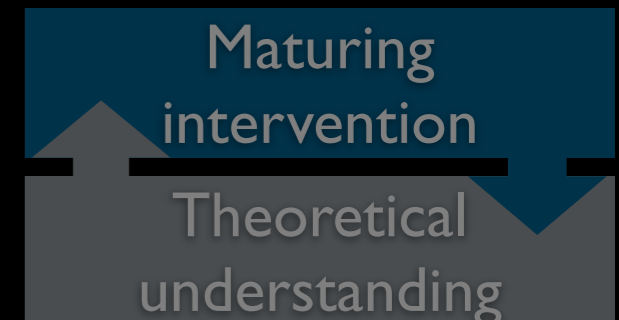
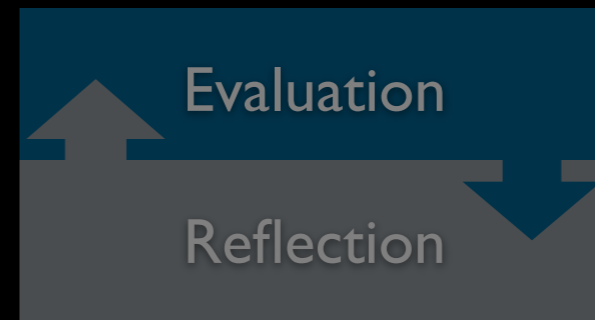
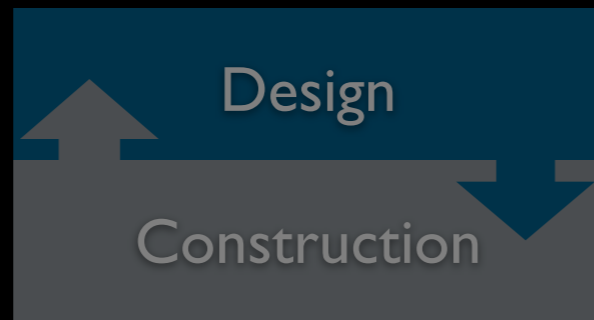
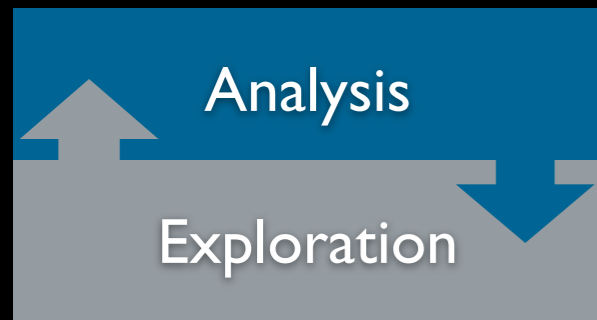
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- Tool mediation
 - Tool (material) versus sign (higher order functions)
 - Explicit versus implicit
- Technology
 - As material tool
 - But rather as sign



Introduction: via a discussion forum

Activity 1: Your HOD has just had one of those cathartic moments: game-based learning is the way to go! While this may be an interesting development, the HOD has asked you, as one of the productive researchers in your department, to undertake a small research project to evaluate how games, one of the most complex technologies available to teachers, could be used in teaching and learning. To help you, the HOD has provided you with a number of papers and a review instrument that you could use to evaluate the teaching designs and outcomes detailed in each paper. The HOD has requested that your evaluations should be presented as a mind map to the members of your department.

Task 1: With a colleague, read the paper abstracts to gain a general understanding of the ideas, research methodology, results and findings. You and your partner need to complete the online review for each paper using the review instrument – a Google form based on the CAT framework.

Task 2: Use this data (Google spreadsheet) collected during the first activity to visually analyse the data with your colleague and individually create a mind map using FreeMind for the HOD. Export your mind map as a PDF file and post it to the forum for group discussion.

Table 1. Workshop design highlighting explicit versus *implicit*, and tool versus sign mediation



Presentation of the TED video on the first AI MOOC and class analysis using the CAT framework

Activity 2: A lecturer, who teaches first-year students, has approached you with an idea for a new online learning activity. The lecturer suggested that a recent newspaper article, entitled "Fracking up the Karoo" (Sunday Times, 5 August 2012), could be used as part of this activity. The lecturer also requested that the activity should take about two hours to complete and be based on the principles associated with authentic learning. Prior to implementing the design, you have been asked to prepare a presentation to the lecturer's department.

Task 1: Using the core concepts of authentic learning, social collaboration and tool/technology mediation knowledge construction ([the CAT framework](#)), work with your partner to design the learning activity. Prepare a [presentation](#)* of your ideas using Google presentation, a collaborative authoring tool.

Task 2: Share your Google presentation with the workshop facilitator for a class discussion on your task designs.

Workshop evaluation using the [CAT framework online instrument](#).

Table 2. Workshop design highlighting [explicit](#) versus *implicit*, and tool versus sign mediation



- Eclectic-mixed methods-pragmatic approach
- Seven iterations
- Artifacts
 - Activity 1: Paper review*, mind maps and graphical data presentation
 - Activity 2: Learning task design* and workshop evaluation*

* CAT framework instrument



Paper	Instrument		Participants	
	<i>n</i>	Cronbach's α	<i>n</i>	ICC
1	18	0.87	18	0.27***
2	18	0.75	10	0.14***
3	18	0.86	18	0.26***
4	18	0.92	6	0.38***
5	18	0.77	7	0.16***

Table 3. Reliability (Cronbach's α) of and participant scoring (Interclass Correlation Coefficient) of the papers using the CAT framework instrument (Significance: *** = < 0.001, ** = 0.001, * = 0.01)

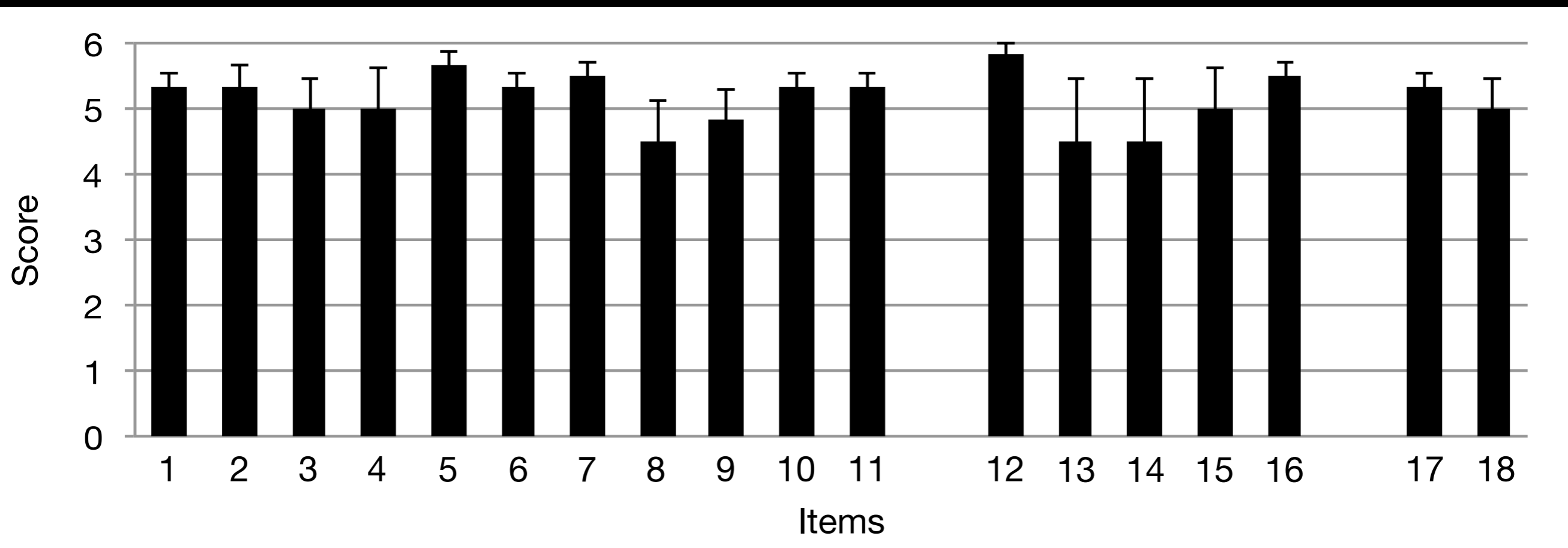


Figure 1. Analyses of journal article 1 by workshop participants using the CAT framework (bar - SE)

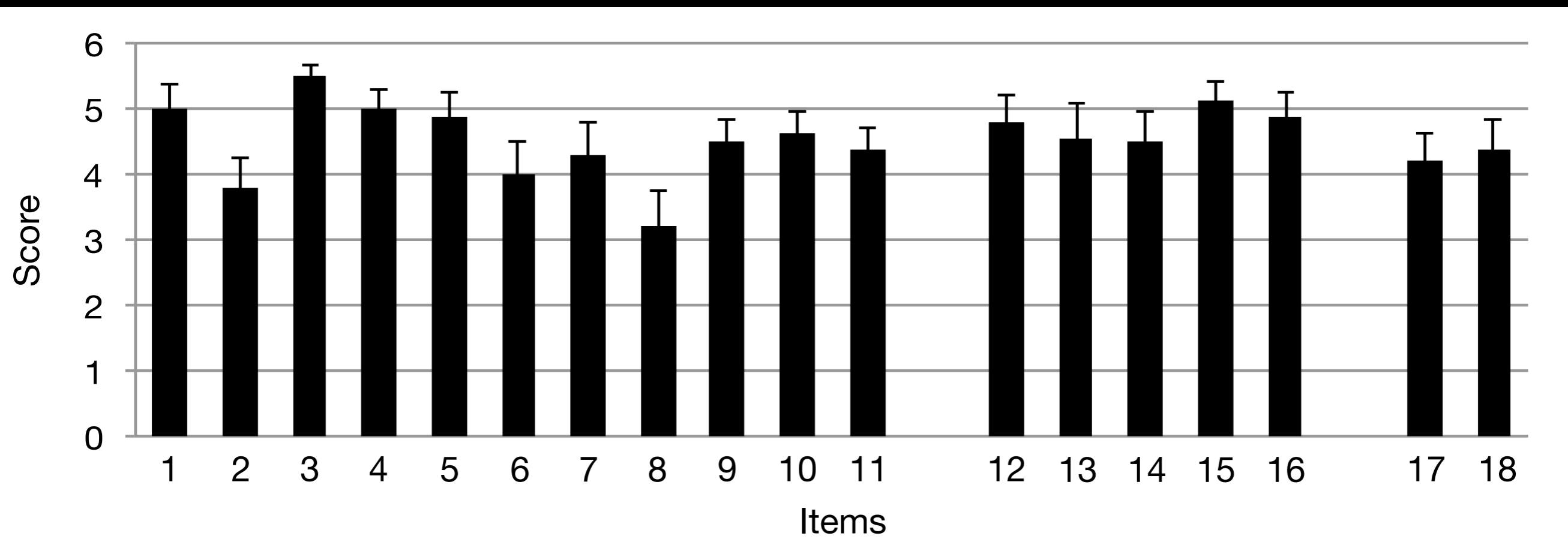


Figure 2. Analyses of journal article 2 by workshop participants using the CAT framework (bar - SE)

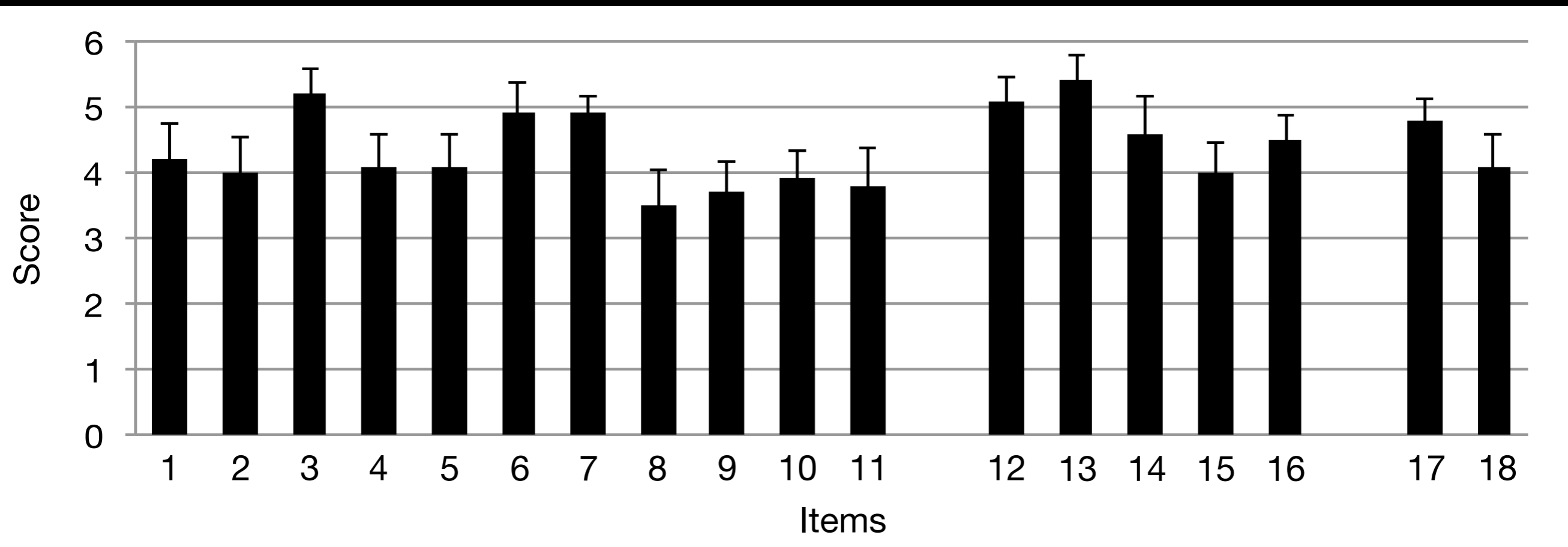


Figure 3. Analyses of journal article 3 by workshop participants using the CAT framework (bar - SE)

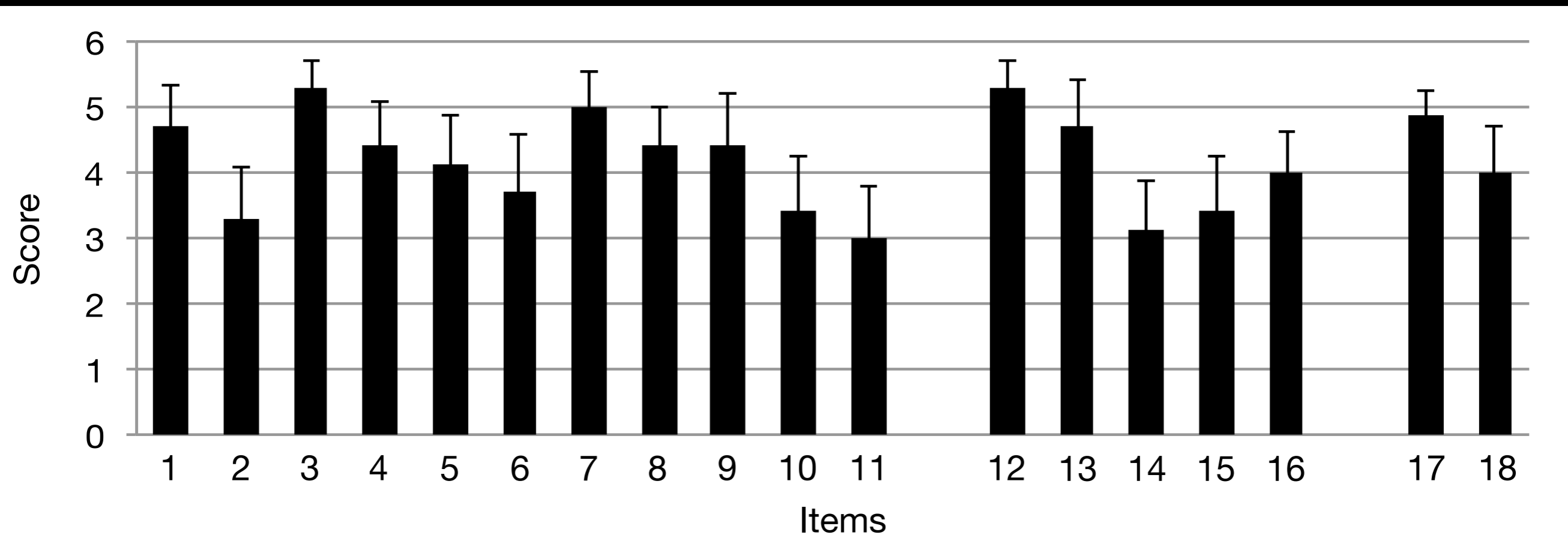


Figure 4. Analyses of journal article 4 by workshop participants using the CAT framework (bar - SE)

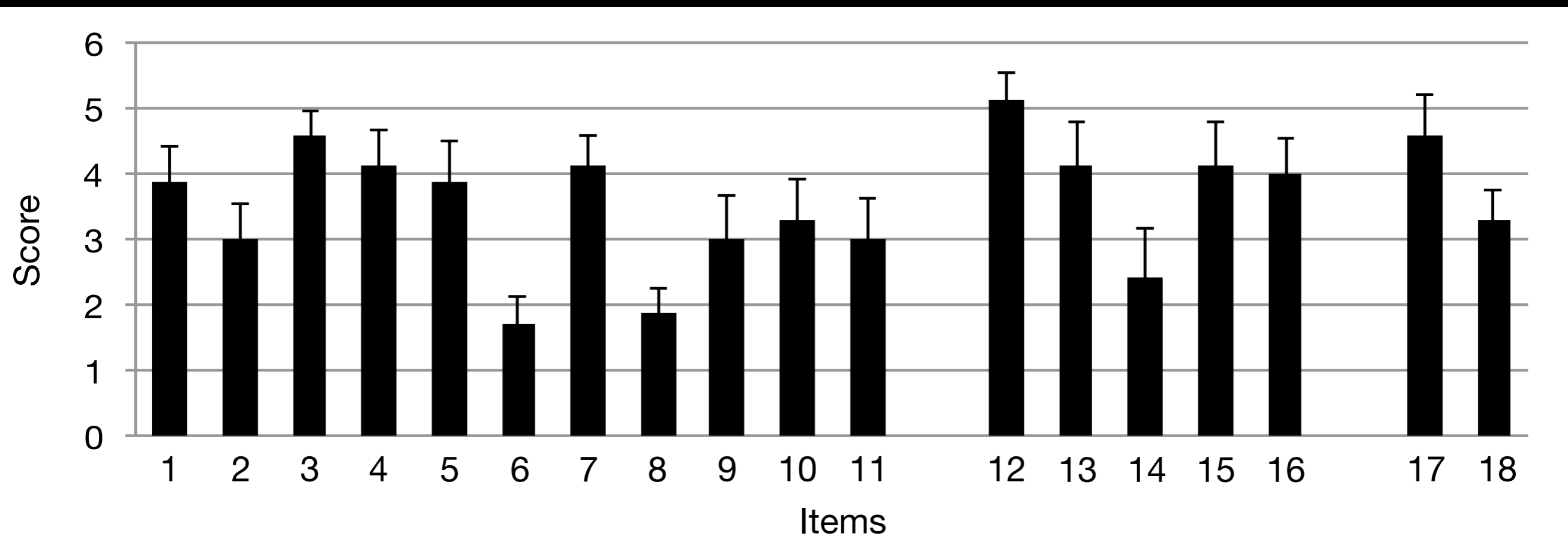


Figure 5. Analyses of journal article 5 by workshop participants using the CAT framework (bar - SE)

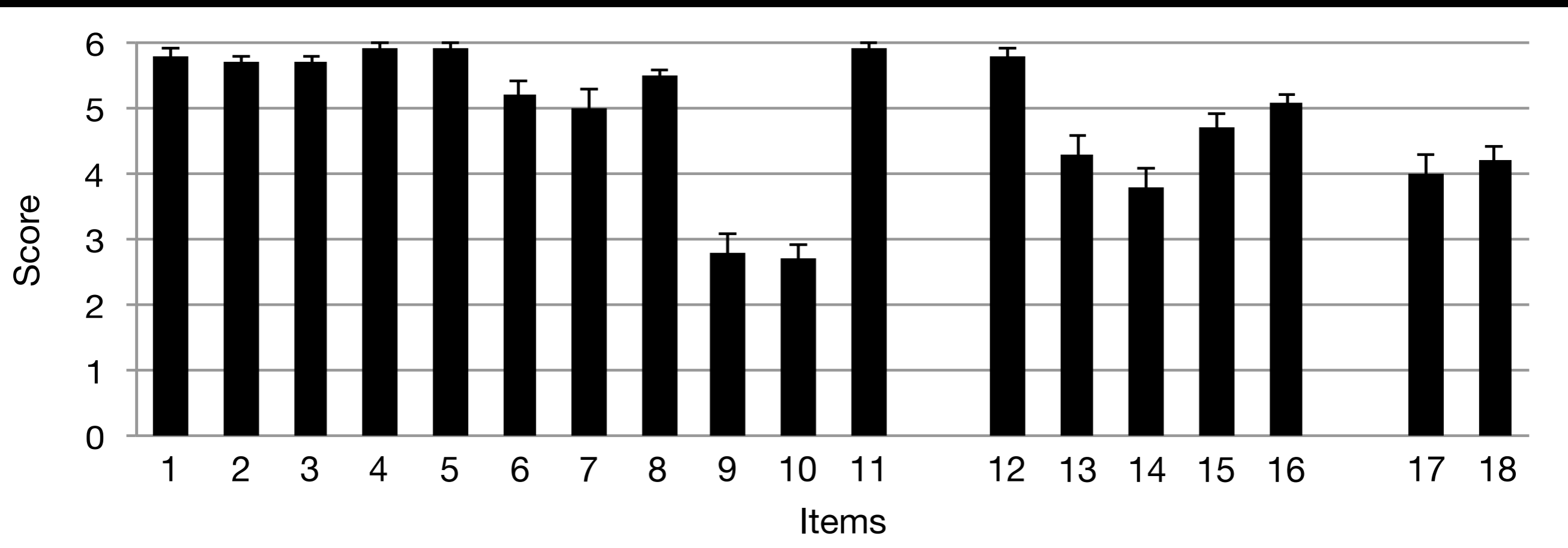


Figure 6. CAT framework instrument analysis of learning activities designed by participants (n=22; bar=SE)

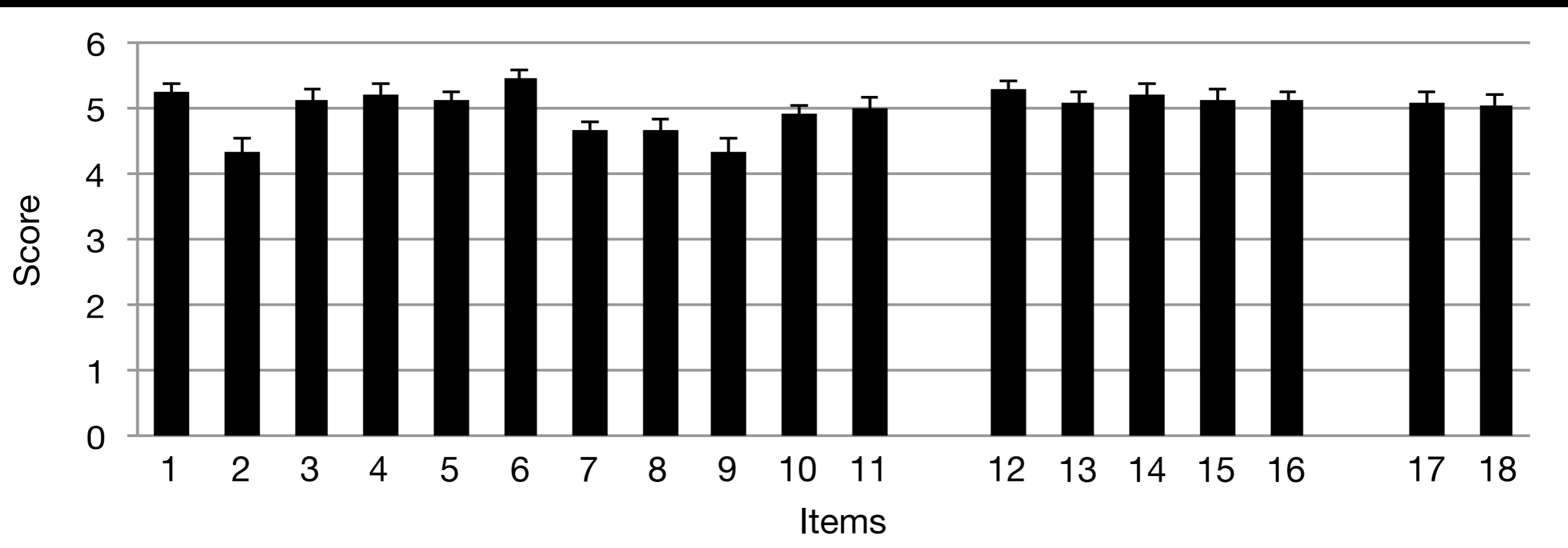


Figure 7. Analysis of the workshop by participants using the CAT framework instrument ($n=30$; bar=SE)



- Two negative comments
- Two comments related to arrangements
- Twenty-five positive comments, for example
 - “An insightful workshop that helps us understand how simple changes to thought and application can help in getting students to learn something old in a new way.”
 - “I loved the workshop! I so much appreciate the departure point of authentic learning, focused on skills and perspective, rather than content. I enjoyed the engagement, and the discussions at the end. Maybe mid-way through the workshop a discussion session would be useful.”
 - “Thanks! The workshop was well facilitated in an enthusiastic, patient, supportive and interactive manner - scaffolded for progress and development of each participant. I've learnt to think differently about designing activities, but will still need a lot of guidance in this regard.”



- CAT instrument allowed participants to
 - Identify pedagogical practices
 - Plan learning activities
 - Evaluate the workshop
- But
 - Explicit and implicit mediation involving either tool or sign were not fully appreciated
 - Use of ICT as tool mediator was mostly limited or superficial



- Findings support declarative design principles
- Activity theory supports design and evaluation
- Authentic tasks promote effective learning
- Technology mediates knowledge construction
- And
 - CAT framework acted as a heuristic to support tool-mediated knowledge construction
 - Authentic learning as the object of the activity

Thank you