



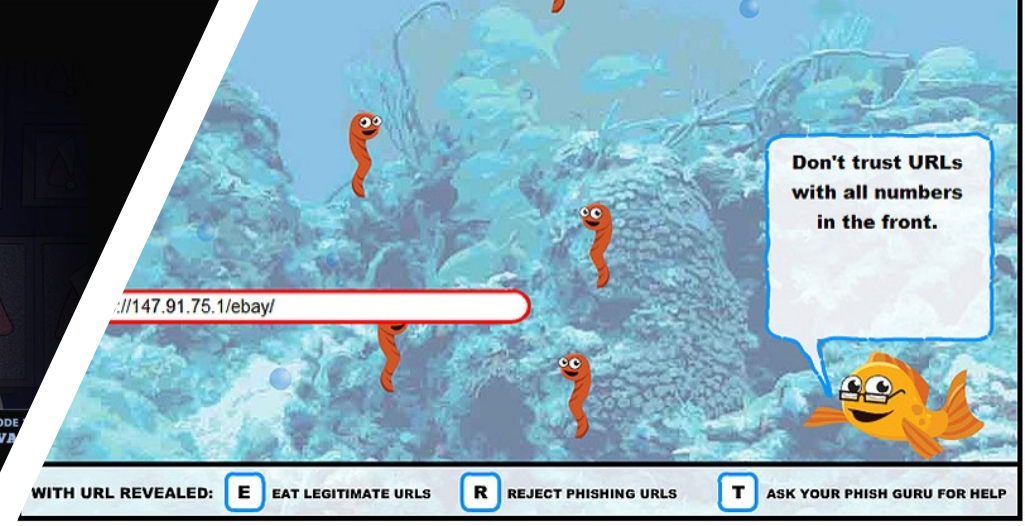
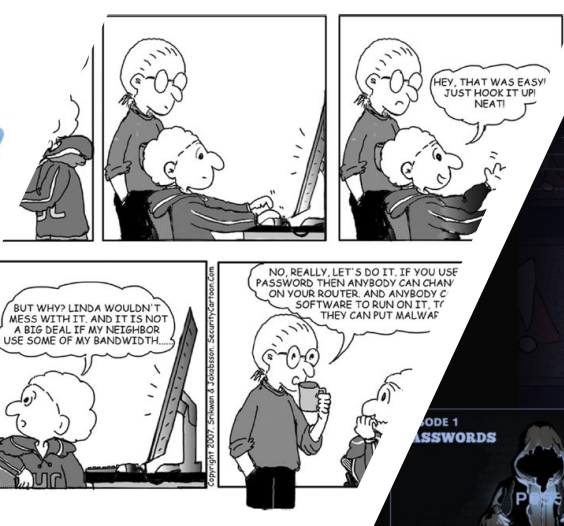
Comparing Teacher and Creator Perspectives on the Design of Cybersecurity and Privacy Educational Resources

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SOUPS 2024





A Plethora of Resources

119 cybersecurity educational tools created between 2000 to 2019

Zhang-Kennedy et al. 2020



Limited Evaluation & adoption

- Around **30%** of the tools received some evaluation to assess their "effectiveness" (learning, engagement, usability)
- A small number of evaluated tools have received **public adoption and usage**



RQ1: What do teachers consider when choosing cybersecurity and privacy teaching resources?

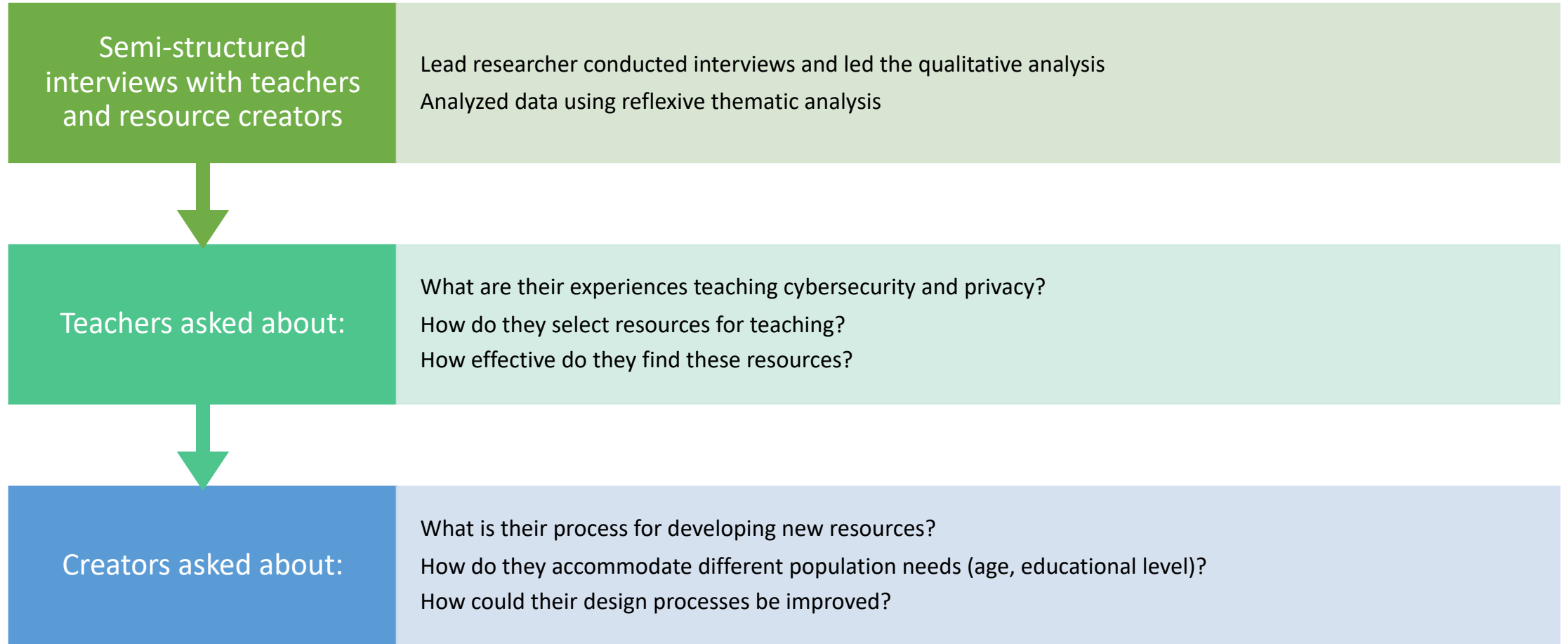


RQ2: What do resource creators consider when curating, designing, and evaluating cybersecurity and privacy classroom resources?



RQ3: How do creators' design considerations and processes align with the needs of teachers and students to teach and learn about cybersecurity and privacy?

Methodology



Participants

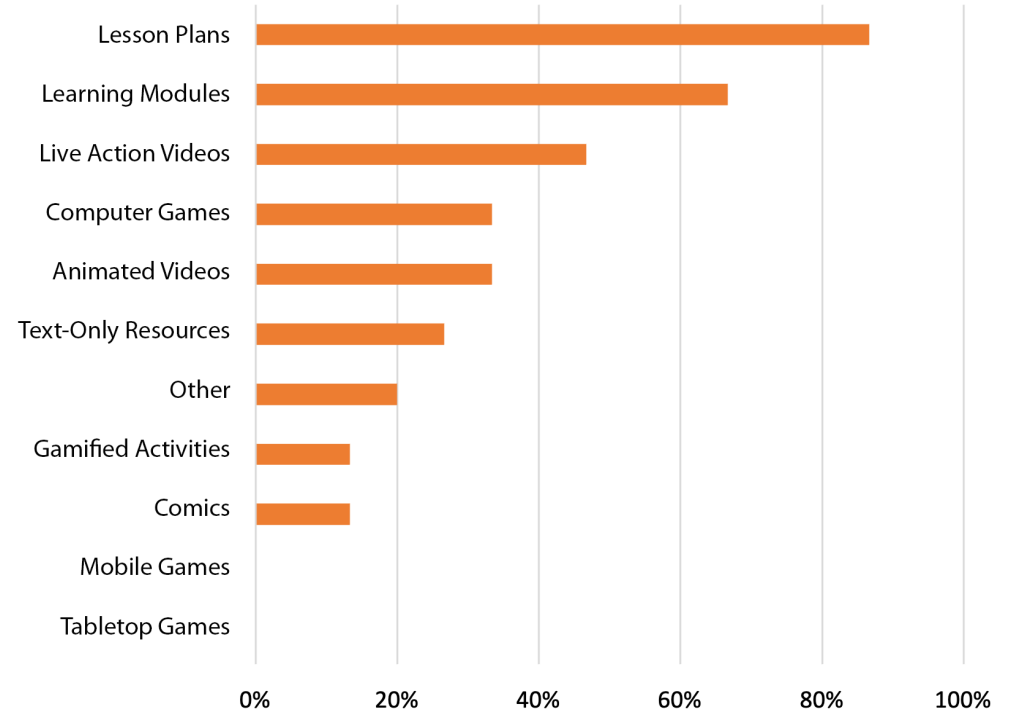
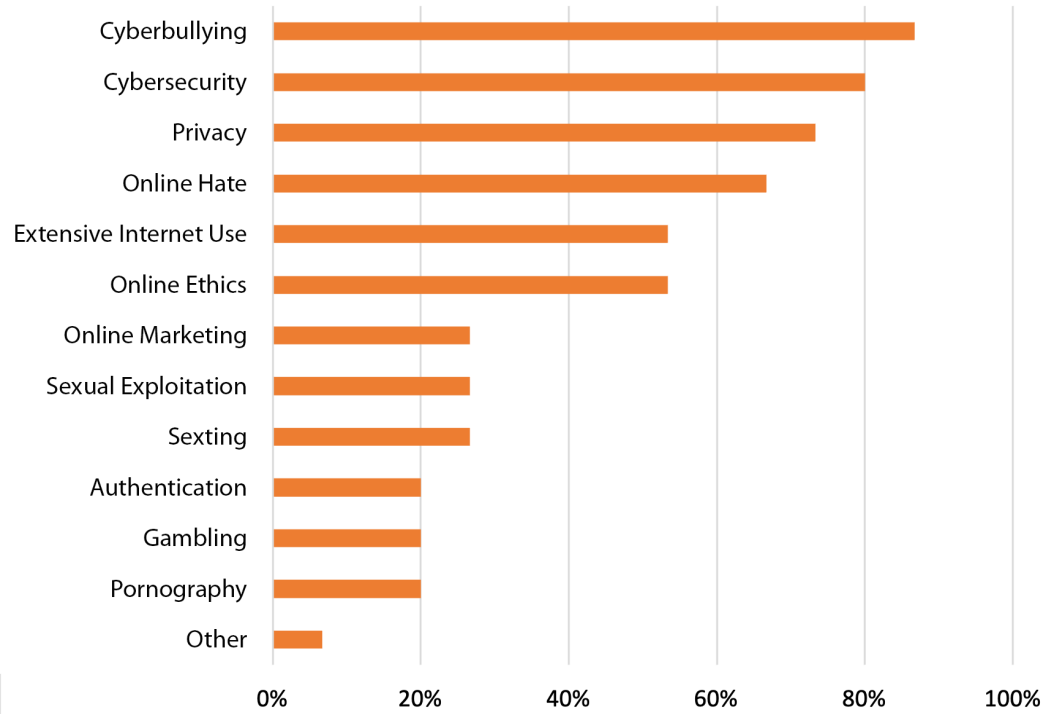
Teachers

- 15 Canadian middle-school teachers
- 67% female, 33% male
- Range of teaching experiences (1 – 35 years)
- 93% teaching in public schools
- 87% had background in arts

Creators

- 8 resource creators with roles including designer, developer, project manager, and educational director
- 50% female, 50% male
- 88% based in Canada
- 75% were mid-to-late career
- 75% had graduate degrees

Topics Taught and Resources Used by Teachers



Different Approaches to Cybersecurity Education

- Teachers approach cybersecurity as part of safety
 - Cybersecurity teaching is ad hoc and in reaction to student context
 - Prefer informal assessments
 - Avoid technical perspectives
- Creators frame cybersecurity as part of a dedicated lesson plan
- Little discussion of the circumstances under which cybersecurity comes up in the classroom

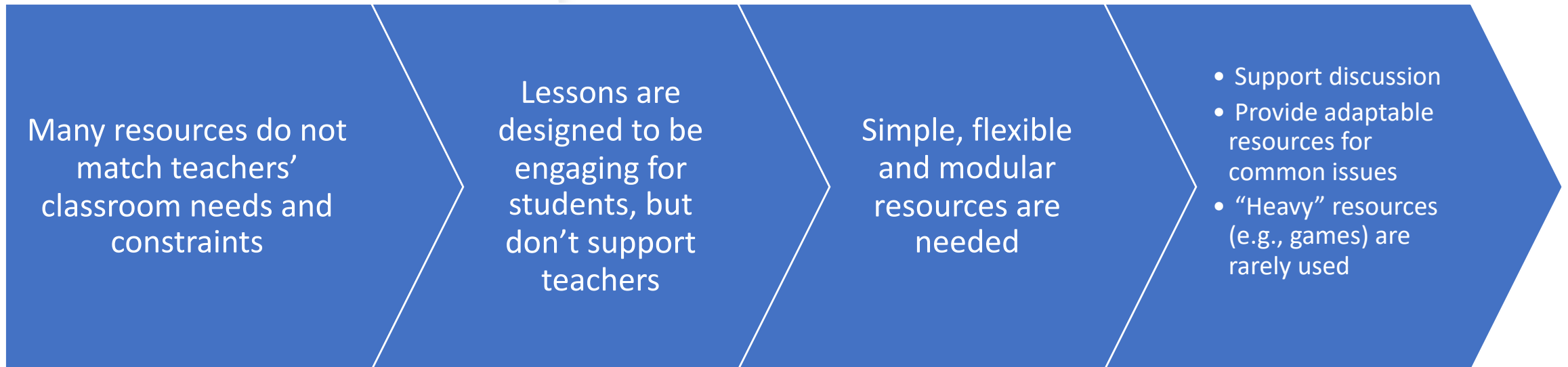
“I don’t want to grade a student on their response to something like this, because first of all, a lot of this is sort of opinion and experience-based. So, I can’t really grade them on that because that’s not part of the curriculum.” – T9

Same problem; different perspectives

- Teachers are trying to fit available resources to fit their circumstances
 - Emergent events in the classroom
 - Curriculum demands
 - Availability of classroom time/resources
- Creators are starting with a blank slate
 - Trends in cybersecurity topics
 - Funding considerations
- Little direct feedback from teachers or students in the design process

“We’ll just use the phishing example because most of the time we get requests around how do students be more aware of malicious attacks or phishing, but then we don’t really understand who is this going to. [...] What are the students really experiencing? How are they digesting that information?” – C5

What is available vs. what gets taught





Conclusion

- Creators aren't prioritizing the needs of teachers, and as a result, teachers aren't using many of the materials available
- To support effective early education in cybersecurity and privacy, teachers need modular lessons they can quickly adapt to changing contexts

Thank you!

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