

Gamification, Interdisciplinarity, and Learning Networks:

A Holistic Approach to Professional Development in Energy Industry.

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 **TU Delft**



Introduction

Gamification

Professional
Development

Interdisciplinarity

**Networked
Learning**



Reimagining professional development for the 21st century

Research Aims

- **Enhancing Pedagogical Practice:**

Identifying effective practices for engaging online learning experiences.

- **Developing Assessment Methods:**

Creating robust tools to evaluate networked learning.

- **Boosting Engagement:**

Using gamification to sustain motivation in professional development.

- **Promoting Equity and Accessibility:**

Ensuring all professionals have access to learning networks.

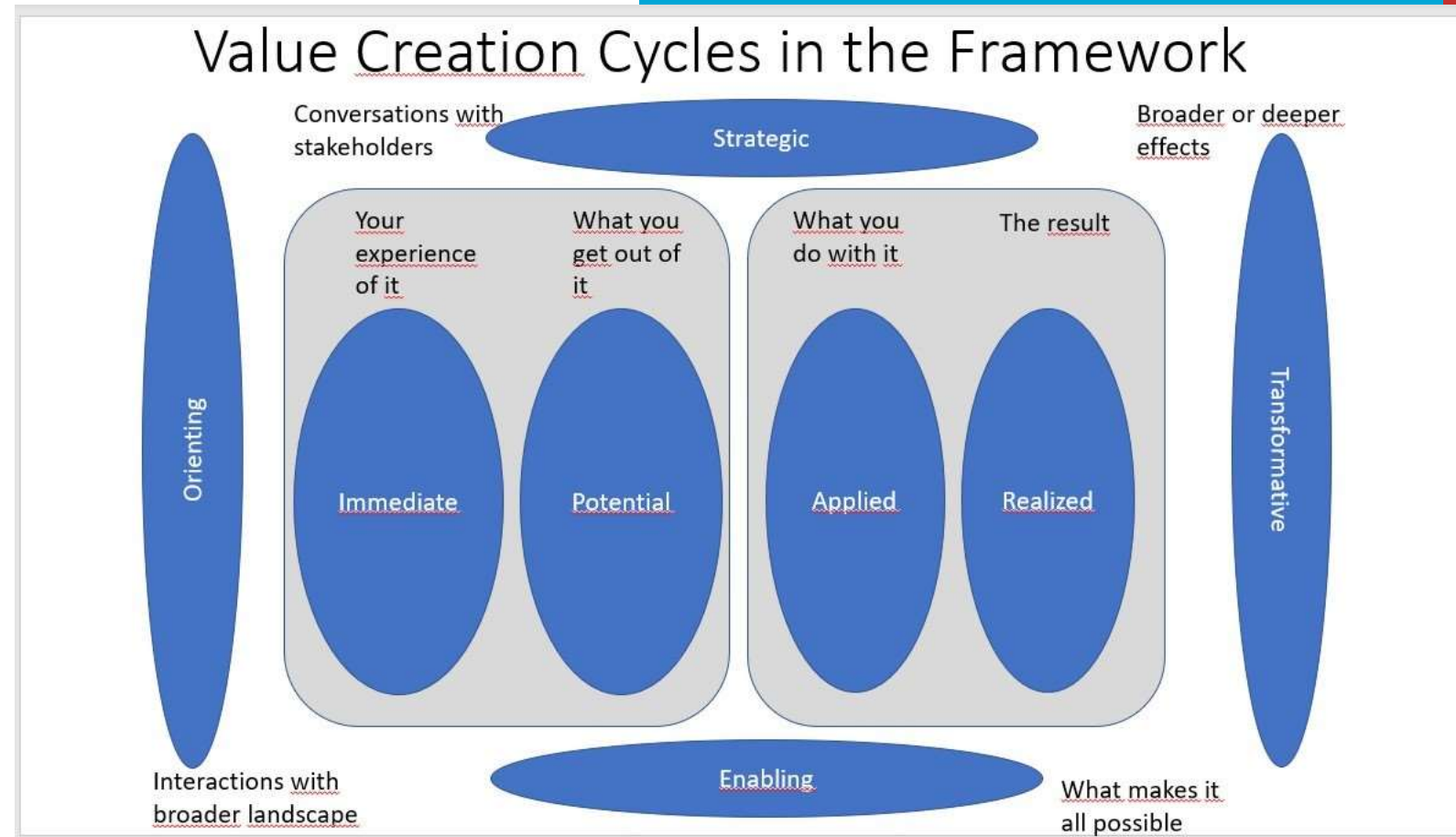
Theoretical Framework

- **Networked Learning:**

Utilizing ICT to connect learners, tutors, and resources.

- **Value Creation Framework:**

Understanding the benefits of learning networks through various value cycles.





Methodology

Literature Review:

Analyzing existing studies on networked learning and professional development.

Case Studies:

Investigating real-world applications in the energy management systems industry.

Gamification Interventions:

Implementing and evaluating gamification within online learning networks.

Literature Review Findings

Networked Learning Contexts:

Formal and informal settings facilitating professional growth.

Social and Individual Attributes:

Autonomy, collaboration, and trust within learning networks.

Domains: Applications in various fields, including higher education and industry.



Case Study Insights



09-10-2020

Case Study Insights



- **Energy Management Systems:**
Challenges and opportunities in knowledge adoption and transfer.
- **Learning Culture and Incentives:**
Importance of incentives and technologies in professional learning environments.
- **Motivations and Barriers:**
highly motivated to engage in networked learning due to the rapid technological advancements

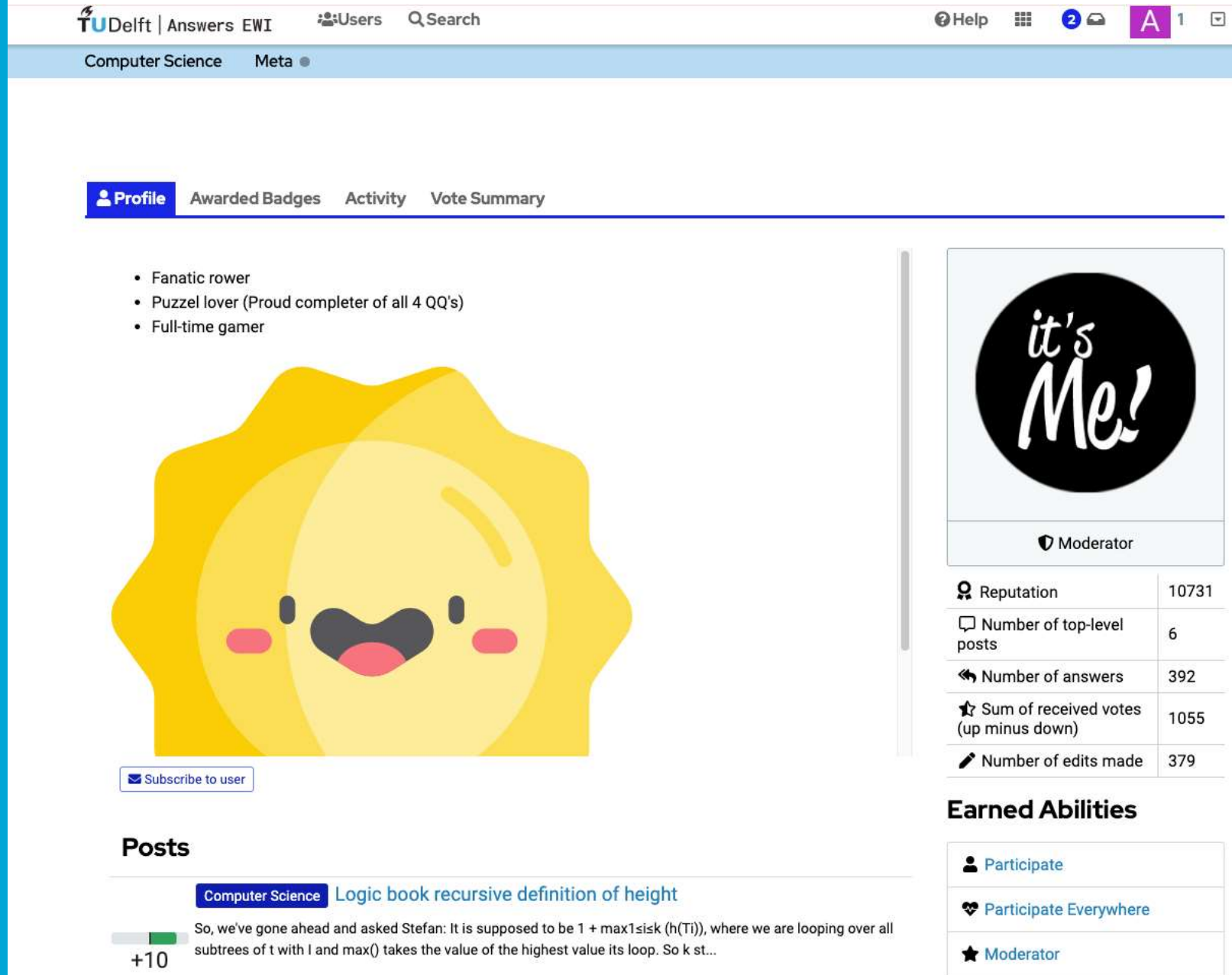
Despite the high motivation, several barriers were identified, including the lack of time, insufficient support from management, and the challenge of integrating learning into daily workflows.
- **Role of Technology:**
Integrating advanced technological tools such as learning management systems (LMS), social media platforms, and virtual collaboration tools plays a vital role in facilitating networked learning.



Gamification in Learning Networks

Gamification in Learning Networks

- **Value Creation Theory:** Enhancing motivation through gamification elements.
- **Interventions:** Designing and testing gamified learning activities within Answer-EWI platform.



The screenshot shows a user profile on the Answer-EWI platform. The user's name is not visible, but their profile picture is a black circle with the text "it's Me!" in white. The user is a Moderator, as indicated by the shield icon. The profile statistics are as follows:

Reputation	10731
Number of top-level posts	6
Number of answers	392
Sum of received votes (up minus down)	1055
Number of edits made	379

The user has earned the following abilities: Participate, Participate Everywhere, and Moderator.

The user's bio lists the following interests:

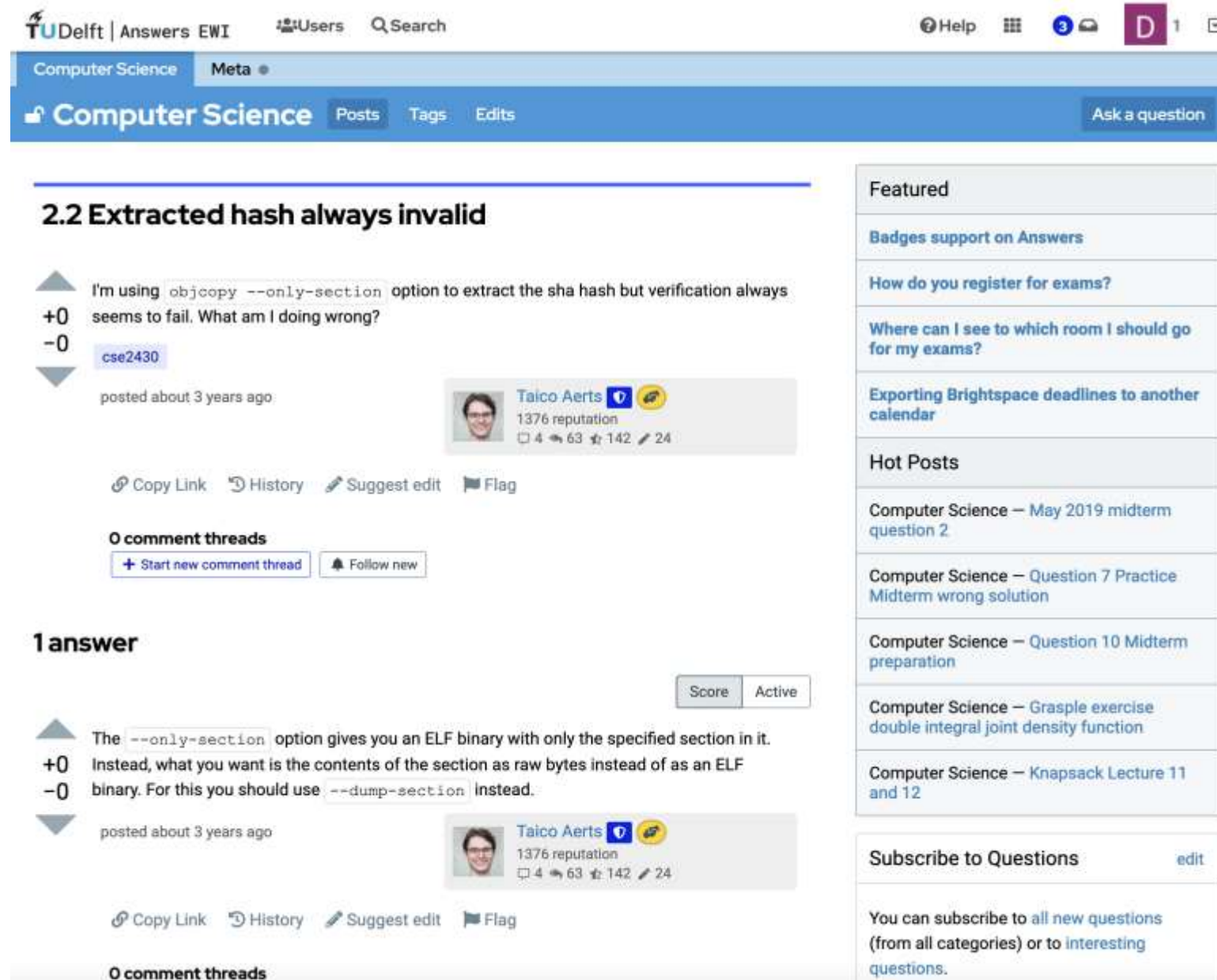
- Fanatic rower
- Puzzel lover (Proud completer of all 4 QQ's)
- Full-time gamer

The user's profile is decorated with a large yellow badge that looks like a sun with a smiling face. Below the badge is a "Subscribe to user" button.

The user's recent posts are shown below. The first post is in the "Computer Science" category and is titled "Logic book recursive definition of height". The post content is: "So, we've gone ahead and asked Stefan: It is supposed to be $1 + \max_{1 \leq i \leq k} (h(T_i))$, where we are looping over all subtrees of t with l and $\max()$ takes the value of the highest value its loop. So k st...". The post has a score of +10.

Our variables

- Engagement and Interaction Evaluation
- Emotions and Experience



The screenshot shows a Stack Overflow-style interface on the TU Delft website. The page title is "2.2 Extracted hash always invalid". The question, posted by user "cse2430", asks for help with the `objcopy --only-section` option. The answer, provided by user "Taico Aerts", explains that the correct option is `--dump-section` to get raw bytes. The interface includes navigation tabs for "Computer Science" and "Meta", a search bar, and a sidebar with "Featured" and "Hot Posts" sections. The "Featured" section lists various exam-related questions, and the "Hot Posts" section lists recent questions and answers.

TU Delft | Answers EWI Users Search Help

Computer Science Meta

Computer Science Posts Tags Edits Ask a question

2.2 Extracted hash always invalid

I'm using `objcopy --only-section` option to extract the sha hash but verification always seems to fail. What am I doing wrong?

+0
-0

cse2430

posted about 3 years ago

Taico Aerts 1376 reputation
4 63 142 24

Copy Link History Suggest edit Flag

0 comment threads
+ Start new comment thread Follow new

1 answer

Score Active

The `--only-section` option gives you an ELF binary with only the specified section in it. Instead, what you want is the contents of the section as raw bytes instead of as an ELF binary. For this you should use `--dump-section` instead.

posted about 3 years ago

Taico Aerts 1376 reputation
4 63 142 24

Copy Link History Suggest edit Flag

0 comment threads

Featured

- Badges support on Answers
- How do you register for exams?
- Where can I see to which room I should go for my exams?
- Exporting Brightspace deadlines to another calendar

Hot Posts

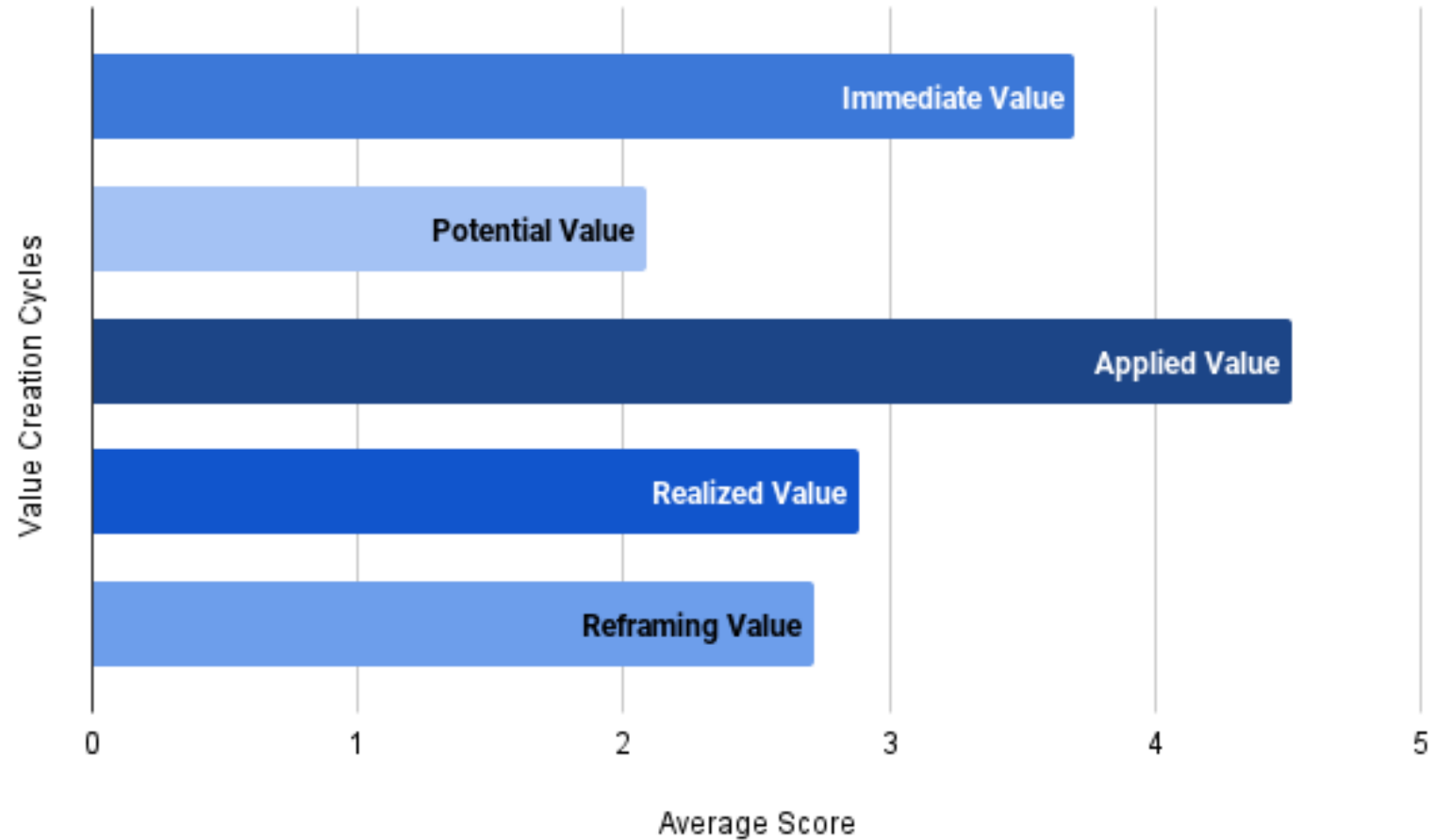
- Computer Science – May 2019 midterm question 2
- Computer Science – Question 7 Practice Midterm wrong solution
- Computer Science – Question 10 Midterm preparation
- Computer Science – Grasple exercise double integral joint density function
- Computer Science – Knapsack Lecture 11 and 12

Subscribe to Questions

You can subscribe to all new questions (from all categories) or to interesting questions.

Value Creation Assessment

- Results indicate that participants had mixed but generally positive reception of the Answers platform.



Motivation and Experience

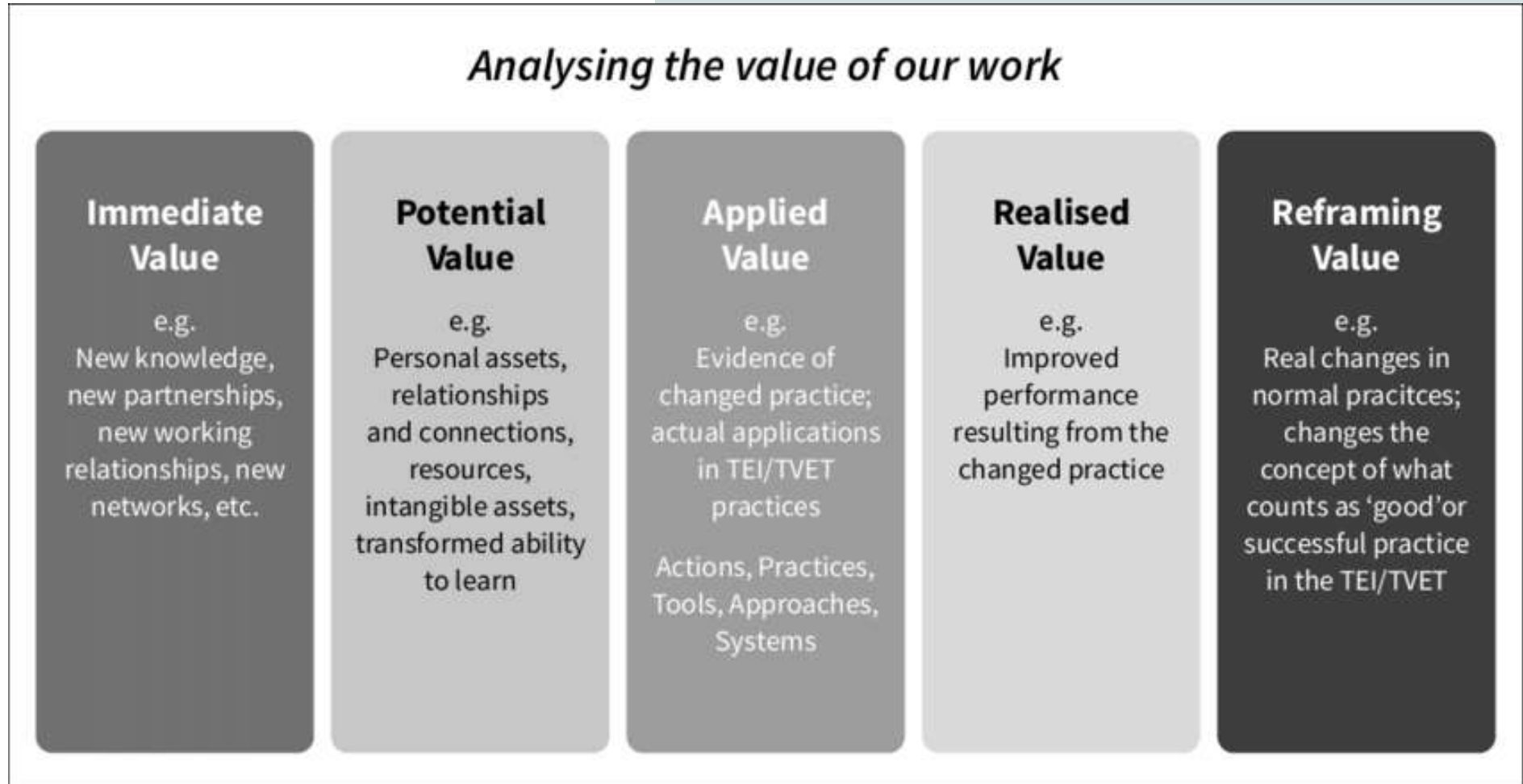
- **Relatedness:** Scored -0.30, indicating the platform did not significantly enhance feelings of connectedness.
- **Interest/Enjoyment:** Scored 2.64, suggesting students enjoyed using the platform.
- **Perceived Choice:** Scored 0.82, indicating some level of autonomy felt by students.
- **Pressure/Tension:** Scored 0.22, suggesting minimal stress associated with platform use.
- **Effort:** Scored 2.09, indicating students were willing to invest effort into using the platform.

IMI Subscale	Average	Std Dev
Relatedness	-0.30	0.59
Interest/Enjoyment	2.64	0.87
Perceived choice	0.82	0.78
Pressure/Tension	0.22	0.90
Effort	2.09	0.71

Assessment Tools

Value Creation Questionnaire: Developed to measure the impact of networked learning.

Testing: Applied in different settings, focusing on online learning environments.



Results and Implications

Theme	Description	Quotes
<i>No Practical Application</i>	Participants felt the course lacked practical knowledge and application opportunities.	"Didn't get enough practical knowledge or the chance to exercise what I learned, while working in the construction industry"
<i>Expectation Mismatch</i>	Participants had expectations about course content and format that were not met.	"I expected a much different course. There were very few video lectures and notes."
<i>No Impact on Career</i>	Participants felt the course had little impact on their career or personal development.	"It didn't have a big impact on my career or personal development."
<i>Course Difficulty</i>	Participants found the course challenging or too complex.	"The first module was way too complicated for me."

Results and Implications

Theme	Description	Quotes
Knowledge Enrichment	Participants gained new knowledge and insights in various fields.	"It broadened my knowledge on water purification methods and gave me insight in how calculations such as for pressure within Reverse Osmosis worked.
Skill Development	Participants reported acquiring new skills and enhancing existing ones.	It helped me gain a new skill and knowlage.
Confidence Boost	Engagement in courses increased participant's confidence in their abilities and knowledge.	It gave me the confidence and knowledge that I lacked on the subject.
Career Advancement	Participants felt the courses assisted them in their career growth and development.	Participation in the Coursework, helped me acquire a lot of knowledge in the field of biomedical engineering.

Results and Implications

Pedagogical Practices:

Effective strategies for online professional development.

Engagement and Motivation:

Positive impact of gamification on learner engagement.

Equity and Accessibility:

Strategies to overcome barriers and promote inclusive learning.



Challenges and Solutions

- **Sustainability:**
Ensuring long-term engagement in learning networks.
- **Assessment:**
Developing comprehensive tools to measure learning outcomes.
- **Technology:**
Leveraging innovative tools to support seamless knowledge integration.



Conclusion

- **Contributions:** Enhancing professional development through interdisciplinary, gamified, and networked learning approaches.
- **Future Work:** Further research to refine assessment tools and expand gamification strategies



Thank you for your attention

Contact information