



# On-demand Learning for Better Scientific Software: How to Use Resources & Technology to Optimize your Productivity

A Best Practices for HPC Software Developers Webinar

Elaine M. Raybourn
Principal Member of the Technical Staff
Sandia National Laboratories
emraybo@sandia.gov, @elaineraybourn

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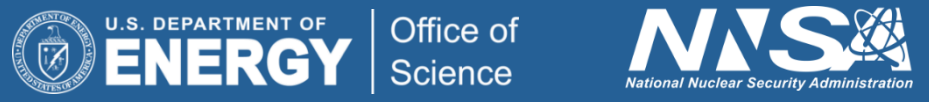

# License, citation and acknowledgements

## License and Citation



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# I help organizations tell their stories.

- I am a social scientist who deepens understanding by being embedded in different cultures.

- Research: innovation and productivity, human-machine teams & systems, design of intelligent learning ecosystems with focus on culturally-aware systems
- Focus on transmedia learning since 2010, games, virtual worlds, social simulations, and immersive intelligent community systems since 2000, ECP since 2017
- Passion: ***Seize opportunities that allow us to learn about ourselves and others***
- Favorite question: ***Why not?***

# Webinar Format

- *What can you expect?*
  - Four 15-minute sections
  - Multimedia resources embedded in this webinar for deeper exploration
  - Transmedia Learning Framework (TLF)
  - TLF examples (GitHub and Python) for motivated learners
  - Call to action
- *Opportunities between each section to ask questions.*

# By the conclusion of this webinar you will be able to:

learning objectives

- Define learning in the wild
- Identify how to make your learning stick
- Discuss why a transmedia learning framework (TLF) can support your productivity
- Describe how to create a personalized transmedia learning framework (TLF) in 6 easy steps

**1** The Challenge
- Cognition in the wild
- The battle for attention
- Transmedia learning

**2** Productive learning habits
- Transmedia learning example
- Making it stick
- Self-directed and
- Self-regulated learning

**3** Transmedia learning framework (TLF)
- Enhancing productivity
- Developing your TLF
- TLF examples (GitHub and Python)

**4** Conclusion
- Personalizing your TLF
- Resources

Outline

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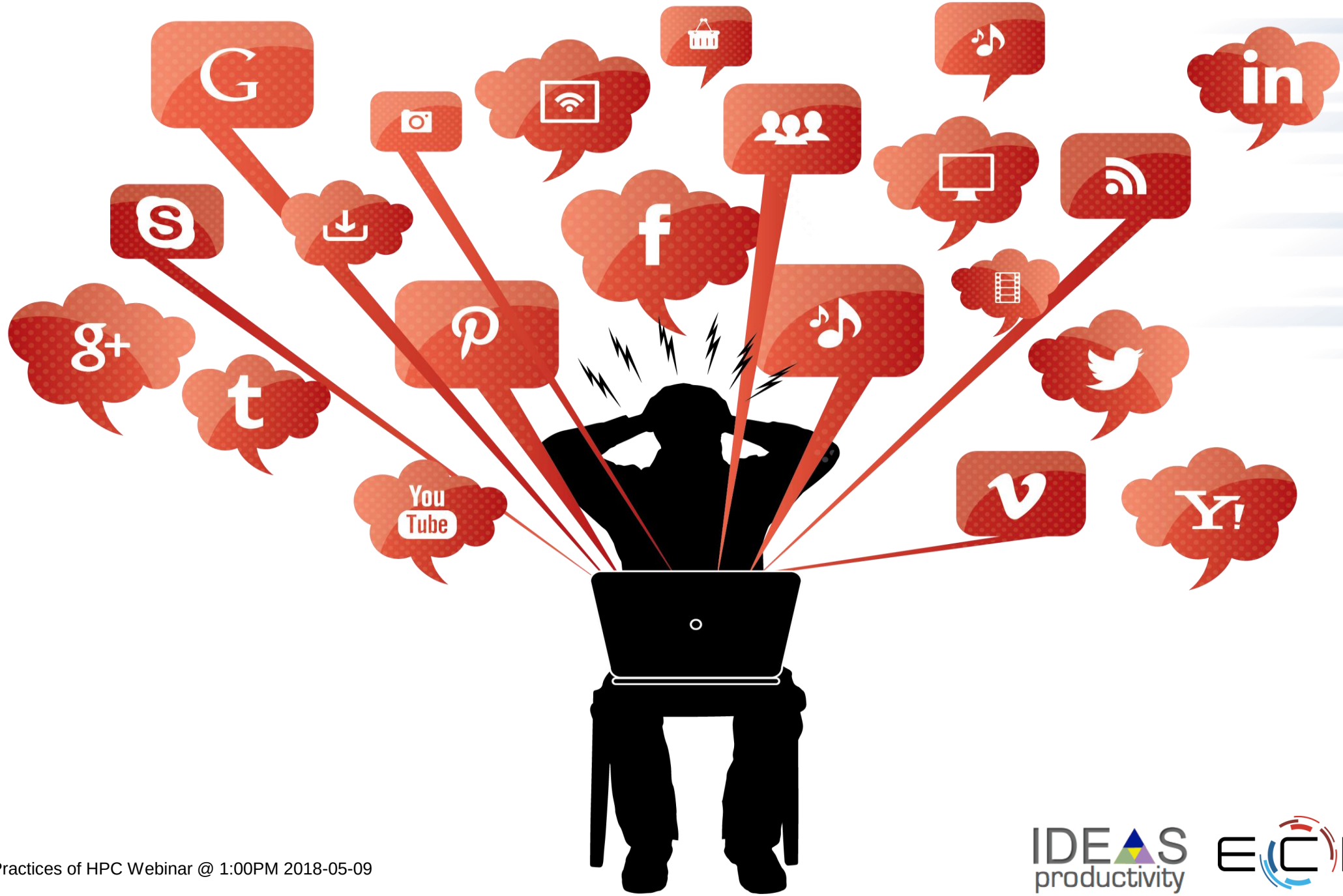
What is Transmedia Storytelling? Cinderella 2.0:Transmedia Storytelling, FCB Global



# Our media habits are changing.

- Stories with a view
  - 87% want to see events through character's lens
- **Second and third screens**
  - 41% use a second screen daily while watching TV
  - Most popular: earning rewards, voting, purchasing
- Innovative advertising
  - 92% agree ads can be more like stories or games they'd naturally choose to engage with

Latitude "The Future of Storytelling, Phase 2 of 2," 2012

- **Parallel worlds**
  - 91% say narratives with "real-time" character development would motivate them to tune in more often
- Real-world products integrated with content
  - 73% interested in discovering real-world products in a story
- **Multi-platform now includes the real world**
  - 94% feel the "real world" should be treated as another platform for content interaction

**Our cognition is**

# increasingly

# distributed



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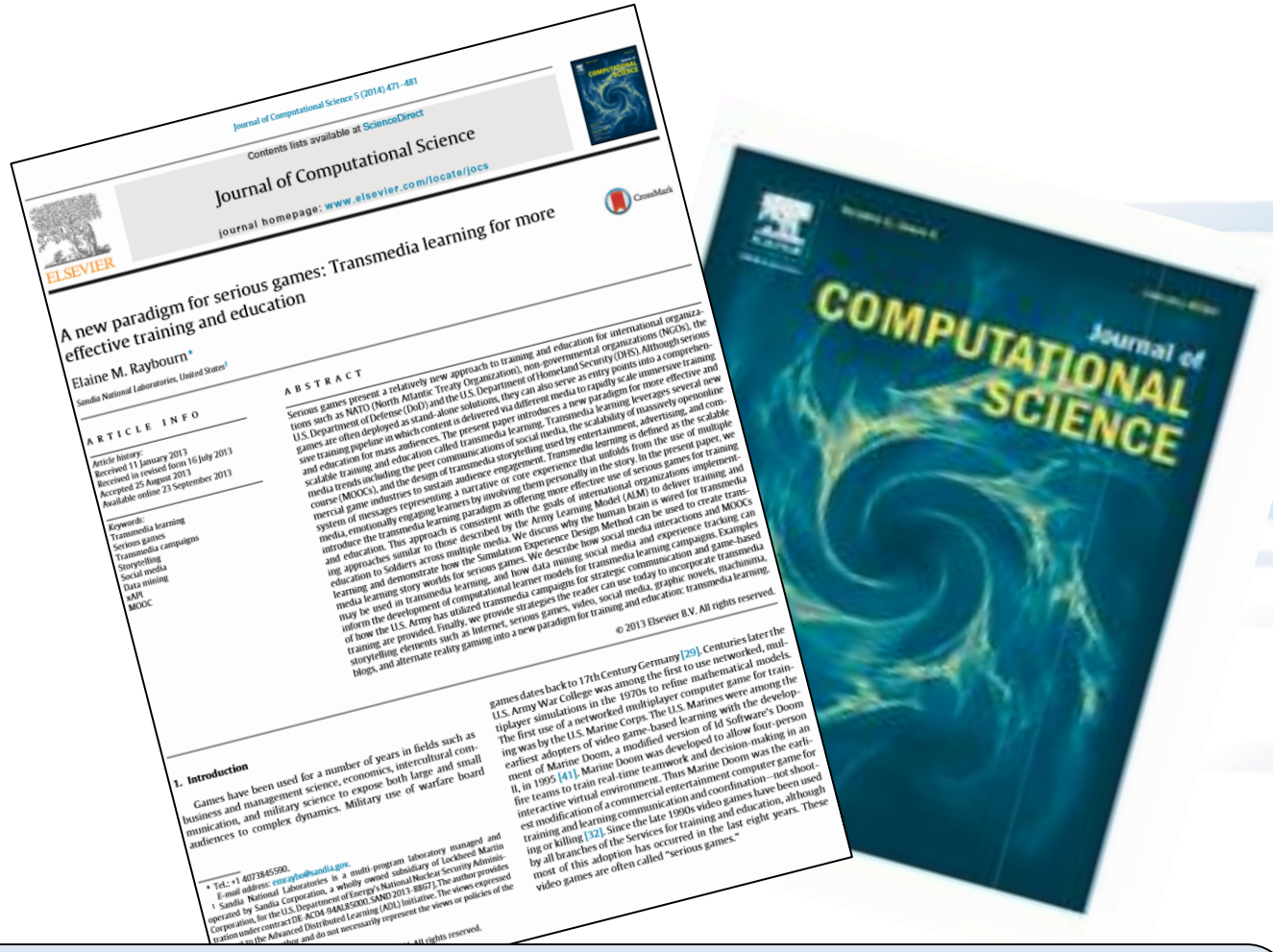
Learning
24/7

Connected
Social



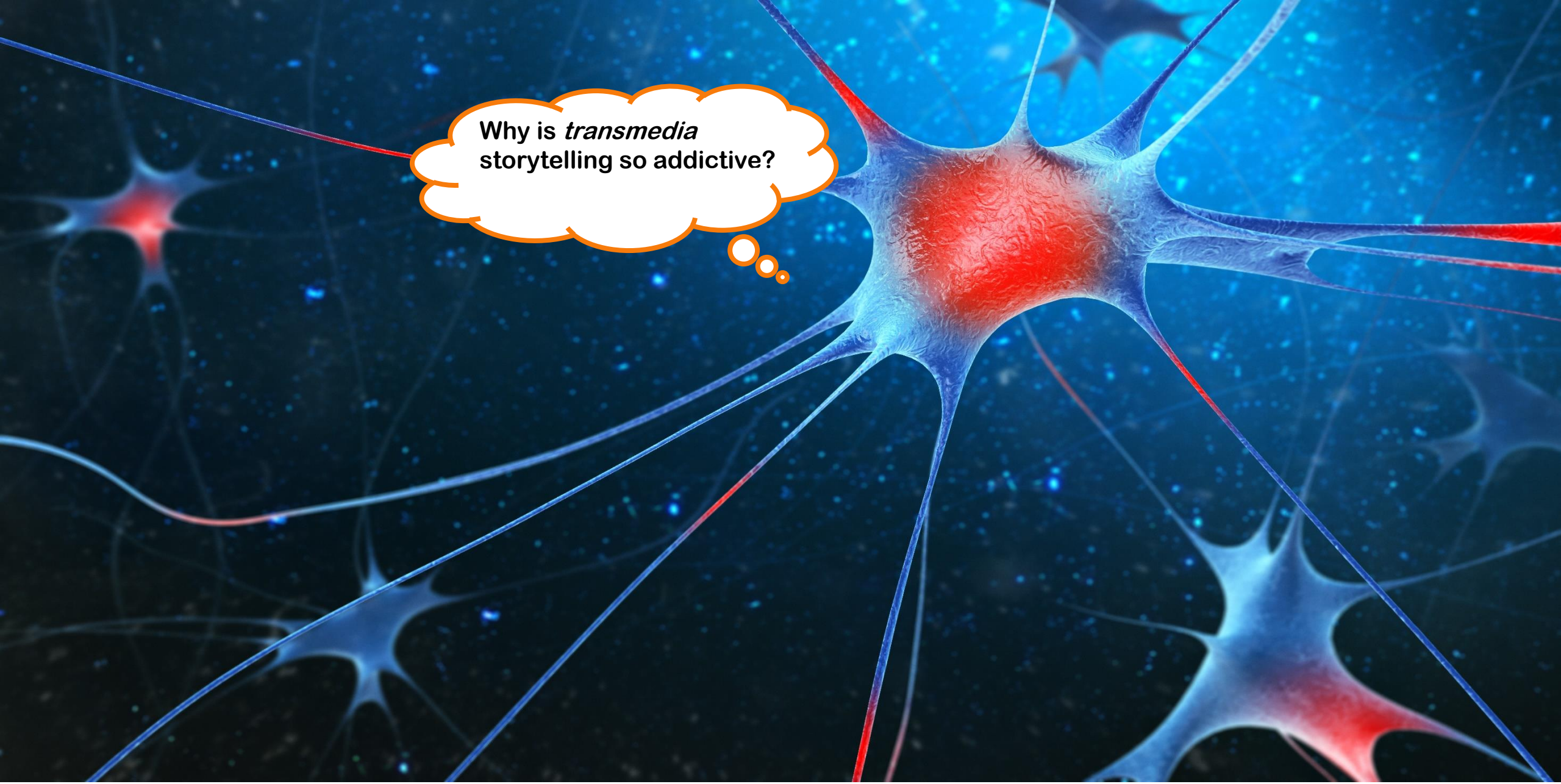

**Transmedia learning** is the scalable system of messages representing a core experience that unfolds from the use of multiple media and emotionally engages learners by involving them personally in the story.

**Raybourn, 2014, *Journal of Computational Science***

Raybourn, E.M. (2014). "A new paradigm for serious games: Transmedia learning for more effective training and education." *Journal of Computational Science*, 5,3, 471- 481. http://www.sciencedirect.com/science/article/pii/S1877750313001014

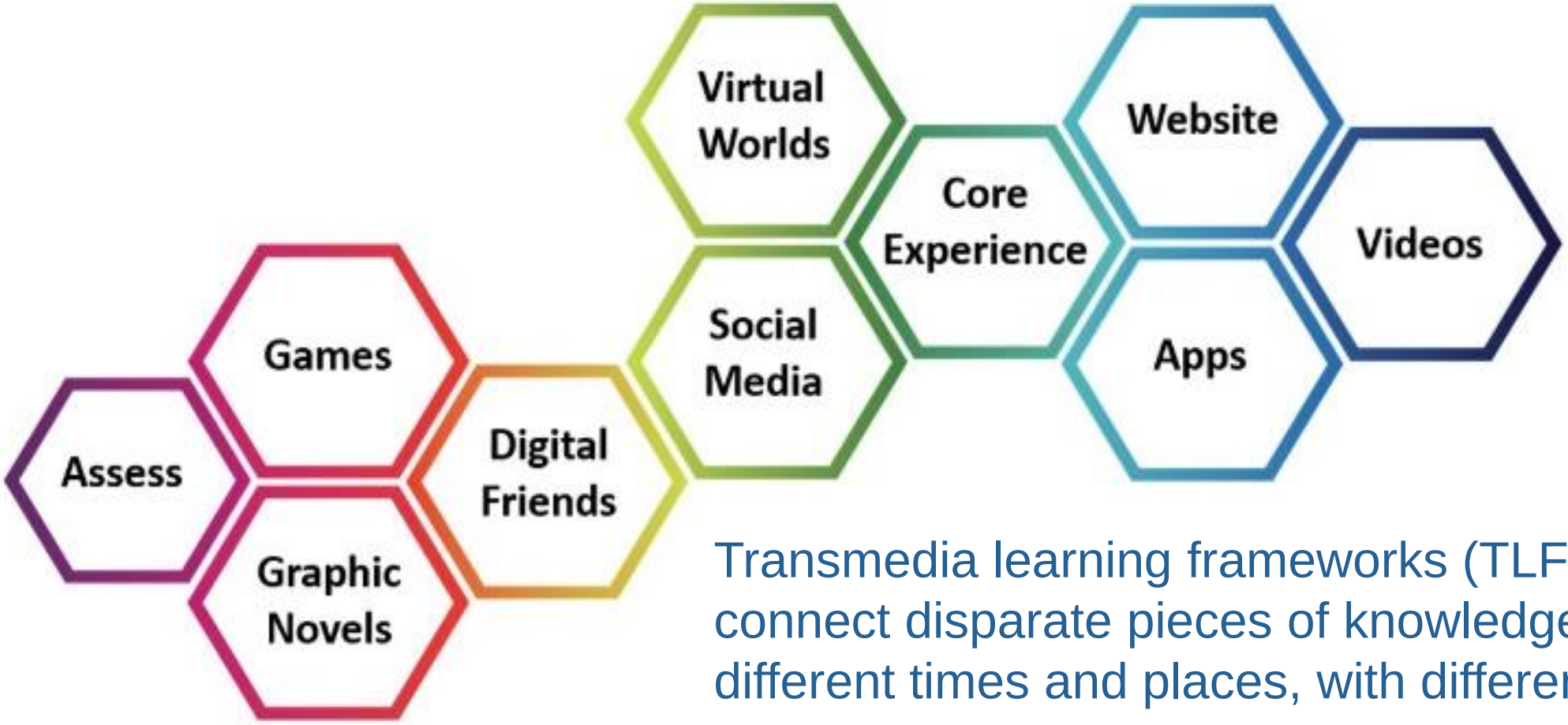
| | Multimedia | Transmedia Storytelling | Transmedia Learning | Blended Learning |
|---|---|---|---|---|
| Involves several different media, can be a single package | ☺ | ☺ | ☺ | ☺ |
| Story uses multi-media and is told *across* multiple platforms and formats | | ☺ | ☺ | |
| Each media element makes distinctive contribution to story or core narrative | | ☺ | ☺ | |
| Intent is to engage audience emotionally | | ☺ | ☺ | |
| User actions affect the experience of content across multiple platforms (unlock content) | | ☺ | ☺ | |
| Leverages user-generated content (social media channels) | | ☺ | ☺ | |
| May be included in formal learning program | ☺ | ☺ | ☺ | ☺ |
| Learning may be informal | ☺ | ☺ | ☺ | ☺ |
| Instructor-led focus with supplemental online or digital media | ☺ | | | ☺ |

Raybourn, E.M. (2016). Transmedia Learning in the Wild: Supporting Military Training Through Story-driven Engagement. I/ITSEC 2016 Interservice/ Industry Training, Simulation and Education Conference Proceedings, November 30- December 3, Orlando, Florida, USA.




Activation, storytelling and cross-platform narrative

# The challenge is *purposeful and productive* learning in the wild




Transmedia learning frameworks (TLF) can help connect disparate pieces of knowledge acquired at different times and places, with different media

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Outline

# Make it count. Make it stick.

- Go wide
- Desirable difficulty
- Self-quiz
- Spaced retrieval
- Elaborate
- Spaced practice
- Interleave learning
- Generate
- Reflect


Brown, P. C., Roediger, H. L., III., & McDaniel, M. A. (2014). *Make it stick: The science of successful learning*. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.

# Habits of successful learners

## Self-directed learning

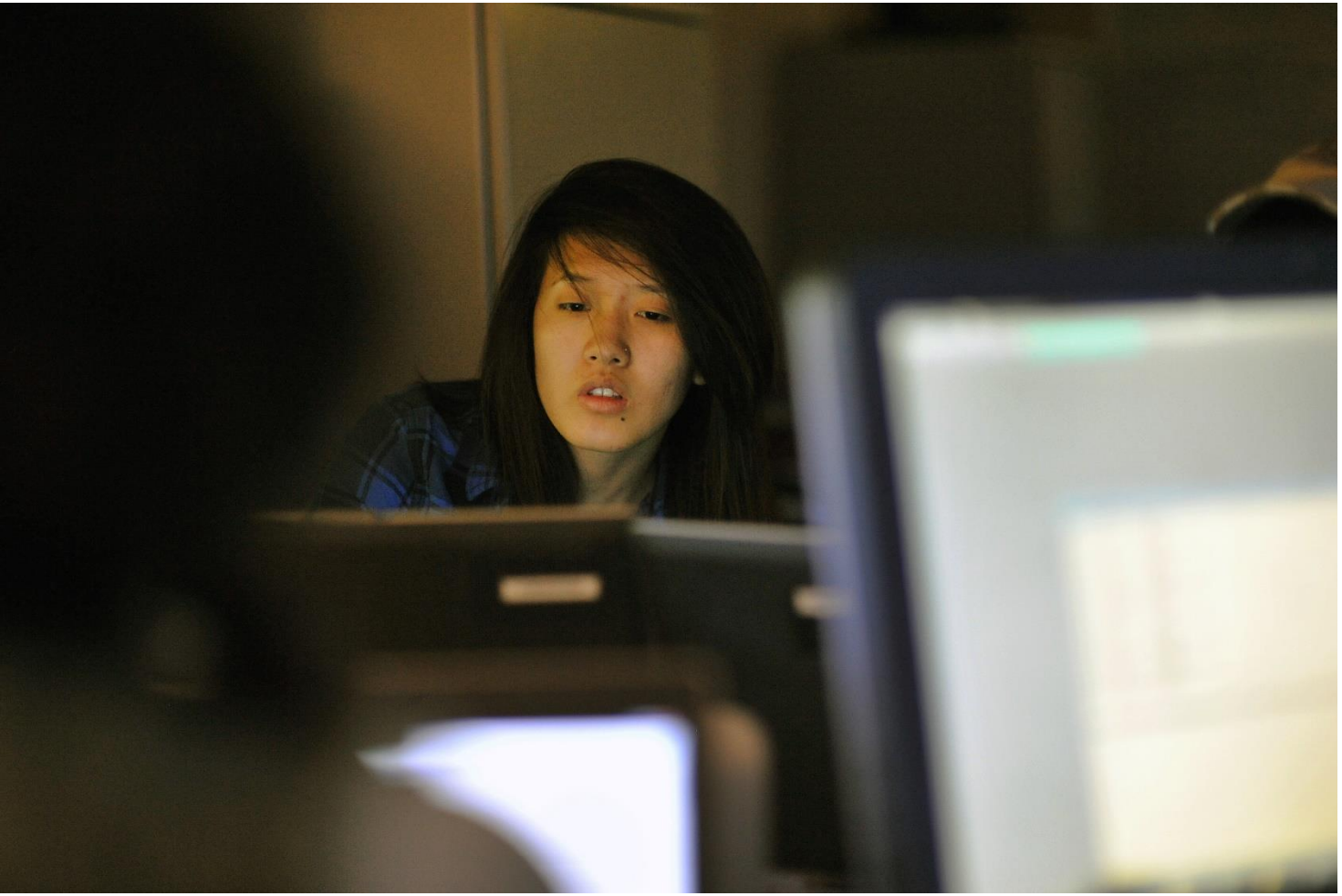
- Takes initiative
- Independent
- Creative and Critical
- Observant
- Can learn in self-paced manner
- Responsible
- Questions peers before instructors
- Reflective

## Self-regulated learning

- Sets goals
- Plans ahead
- Has diverse strategies
- Manages resources
- Monitors progress
- Seeks challenges
- Persistent
- Self-aware

Bracey, P. (2010). Self-directed Learning vs Self-regulated Learning: Twins or Just Friends?. In J. Sanchez & K. Zhang (Eds.), Proceedings of E-Learn 2010. Orlando, Florida, USA: Association for the Advancement of Computing in Education (AACE). Retrieved from https://www.learntechlib.org/p/35780/.

# Yes, *and*… Self-directed *and* self-regulated learning.




Elaine Raybourn TEDx Talk https://www.youtube.com/watch?v=_j-2Ct9V9cQ

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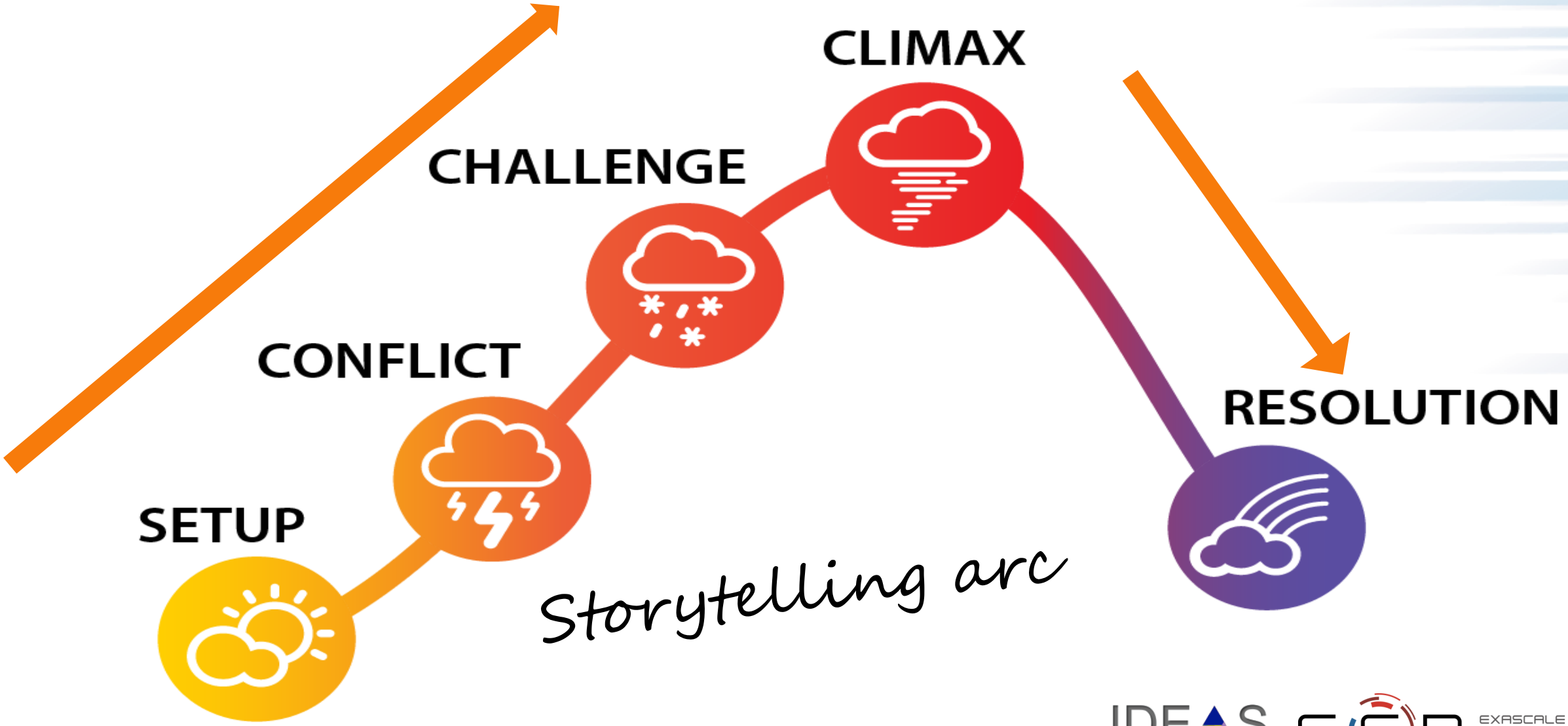
# Your story should be engaging.



# Transmedia Learning Framework (TLF)

- Watch videos - **explore**
  - Review techniques
  - Watch motivational videos
- Website – **study**
  - Read blogs, posts
  - Engage in interactive exercises, MOOCs, tutorials, webinars
- Mobile – **sharpen**
  - Listen to podcasts, audiobooks
  - Self-quiz, flash cards
- Problem-solve in simulations – **master**
  - Practice coding, play games
- Social media – **share**
  - Follow experts, gurus, share ideas with others

*Don't forget to reward yourself!*

# Develop a transmedia learning framework (TLF) in 6 steps.

1. Identify your goals
2. Create your user story
   - As a <user type>, I want to <function> so that <benefit>

*"**As a** casual user of GitHub **I want** more GitHub tutorials and tips **so that** it becomes easier for me to recall functionality."*

3. Identify learning opportunities throughout your day
   - Duration, frequency, and modalities

# Develop a transmedia learning framework (TLF) in 6 steps, cont.

4. Identify technology and media that fit your daily life
   - MOOC – Udacity, Edx, Coursera
   - Twitter
   - Mobile apps
   - Videos
   - Podcasts
   - eBooks
5. Curate your content
   - Word of mouth, advanced search, alerts, etc.
6. Plan your TLF, use learning science strategies
   - set up reminders, email quizzes, motivation, rewards

# Use case 1: Python TLF with MOOC, games, podcast

- Watch videos - **explore**
  - Clever Programmer "Learn Python Programming - 1 - How to Download and Install Python in 2 Minutes"
  - Traversy Media "Python Crash Course for Beginners"
  - Rollin Thomas, NERSC; William Scullin, ANL; Matt Belhorn, ORNL, Python in HPC
- Website – **study**
  - Steve Hudson, Argonne National Lab, Python-Tutorials in Github
  - Cornell University Python Virtual Workshop
  - Udacity MOOC "Programming Foundations with Python"
  - Stackoverflow.com
  - Jupyter Notebooks


*So your code will see the future.*
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Find these **TLFs** for GitHub and Python on better scientific software site



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# Use case 1: Python TLF with MOOC, games, podcast cont.

- Mobile – **sharpen**
  - Podcast "Talk Python to me"
  - My Python Quiz for Beginners
- Problem-solve in simulations – **master**
  - Python Tutor
  - Game: Codewars
- Social media – **share**
  - Wes Mckinney, inventor of Pandas
  - Travis Oliphant - inventor of numpy, SciPy and Anaconda
  - Share ideas with others

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# Use case 2: GitHub TLF with MOOC, flash cards, HPC videos

- Watch videos - **explore**
  - Git tutorial #2: Advanced Techniques with Rachel
  - IDEAS-ECP, Roscoe Bartlett, Sandia National Laboratories Intermediate Git Webinar
- Website – **study**
  - Udacity MOOC How to Use Git and GitHub
  - IDEAS-ECP Git tutorial & reference collection

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# Use case 2: GitHub TLF with MOOC, flash cards, HPC videos, cont.

- Mobile – **sharpen**
  - Git 10 question quiz
  - iPhone App (?) Git Commands Flashcards
  - Git Cheat sheet
  - Clever Bunny: *Make you own* Elixir-flashcards
- Problem-solve in simulations – **master**
  - Try Git tutorial
  - Game: Git-Game
- Social media – **share**
  - GitHub on Twitter
  - Share ideas with others


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Recap

# Personalize your transmedia learning framework (TLF)

- What core experience do you want to support?
- What technologies will you use?
- How do these technologies connect and extend the core experience?
- What outcome do you intend to have? What's your goal?
- What actions do you want to take?
- How will you co-create content?
- How will you assess your learning productivity?

**Transmedia learning** is the scalable system of messages representing a core experience that unfolds from the use of multiple media and emotionally engages learners by involving them personally in the story.

**Raybourn, 2014, *Journal of Computational Science***

# Final thoughts

- You are in control
- Second screen learning
- Practice
- Engage peers
- Leverage crowdsourcing
- Stay connected
- Is your plan scalable – ***will you share it on BSSw site?***
- Social learning

https://bssw.io/contributes/new *So your code will see the future.*

# Resources


- Best Practices for HPC Software Developers https://ideas-productivity.org/events/hpc-best-practices-webinars/
- Bracey, P. (2010). Self-directed Learning vs Self-regulated Learning: Twins or Just Friends?. In J. Sanchez & K. Zhang (Eds.), Proceedings of E-Learn 2010. Orlando, Florida, USA: Association for the Advancement of Computing in Education (AACE).
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- Raybourn, E.M. TEDx Talk—Engage Learners with Transmedia Storytelling https://www.youtube.com/watch?v=_j-2Ct9V9cQ


better scientific software

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https://bssw.io

Collaborative content development on general topics topics related to developer productivity and software sustainability for CSE

We want and *need* contributions from the community … Join us!
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# Are you able to…

Recap: how did I do?

- Define learning in the wild
- Identify how to make your learning stick
- Discuss why a transmedia learning framework (TLF) can support your productivity
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# Share your TLF with us.

# Thank you for your participation!

@elaineraybourn

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