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

A Best Practices for HPC Software Developers Webinar

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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:

- 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
1 The Challenge
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Outline
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

• 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

Latitude “The Future of Storytelling, Phase 2 of 2,” 2012
Our cognition is increasingly distributed
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.

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

Why is *transmedia* storytelling so addictive?
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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Make it count. Make it stick.

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

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

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Yes, *and* … Self-directed *and* self-regulated learning.
Elaine Raybourn TEDx Talk https://www.youtube.com/watch?v=j-2Ct9V9cQ
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Outline
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. [https://bssw.io](https://bssw.io)
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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**So your code will see the future.**

https://bssw.io

Find these **TLFs** for GitHub and Python on better scientific software site
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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Find these TLFs for GitHub and Python on better scientific software site
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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- **Problem-solve in simulations – master**
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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](https://bssw.io/contributes/new) So your code will see the future.
Resources


- Raybourn, E.M. TEDx Talk—Engage Learners with Transmedia Storytelling [https://www.youtube.com/watch?v=_j-2Ct9V9cQ](https://www.youtube.com/watch?v=_j-2Ct9V9cQ)

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[https://bssw.io](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!

[https://bssw.io/contributes/new](https://bssw.io/contributes/new)
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
• Describe how to create a personalized transmedia learning framework (TLF) in 6 easy steps
Share your TLF with us.

Thank you for your participation!

@elaineraybourn

https://bssw.io/contributes/new or README.md

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