Topic

Date: 7/3/2021

Knowledge Resource: https://www.youtube.com/watch?v=xQQvW0FtOjc

Stage 1: Preparing to Learn

Step 1. Success Mindset

- Reconnect to the collaborative mindset
- Take ownership as a contributor to the trash to home 3d printer

Step 2. Why Learn this Subject?

We want to experience a collaborative planning session so that we can effectively collaborate on the HeroX challenge of trash2home

Step 3. Orientation

- Background on the challenge
- Printer requirements
- Collaborative planning document

Step 4. Prerequisites

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Step 5. Learning objectives

- Be able to participate / lead a collaborative plan development
- Develop skills and contribute to collaborative challenges as a way to incent collaborative development

Step 6. Performance criteria

- Build a collaborative plan for trash2home printer system challenge on herox
- Identify elements of the challenge
- Generalize the skills to any project

Step 7. Vocabulary

- Work breakdown structure WBS - collaboration architecture that specifies the tasks and assigns collaborators to tasks
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Step 8. Information

General Information

- How to estimate the feasibility of a 3D trash to house printer - assume 8 print heads, 48 panels, how many panels per day?
- [https://www.aniwaa.com/product/3d-printers/essentium-hse-180-s-lt/ comparison large format 3d printers] $60K to $250k+
- Should we include the shredder & the torch table to make the shredder?
- Could save money on the bearings or other higher-part count/part cost that we can produce "transcend artificial scarcity"
- HeroX platform -- will it incent a lot of people to collaborate?
- Project -> project -> enterprise
- Cf Boxable -- competitor to OBI (https://www.boxabl.com/)
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HeroX Challenge

- Target psychology of "I'm incented to contribute, even if I don't win"
- Review the tech requirements
- Plan video
- Change rules
- Research other printers
- Create plan & work breakdown system

The Printer

- Base on the 3d universal printer
- Heated chamber - design for not destroying the parts
- Filament making -- why not pellets?
- Shredder
- Can produce requirements
- Can develop the price point
- Up to close to 200C -- but will melt many of your components
- "Keep everything sensitive out of the heat"
- High-temperature heated enclosure (see https://wiki.opensourceecology.org/wiki/High_Temperature_Heated_Enclosure) ~0:35:00
- Need a carbon fibre blanket as a heat shield
- Need 100 to 1000 design test iterations -- why we need collaboration
- 3d printed belts (TPU)
- Bearings (need a ball - cheap)
- Blades
- Right now 3D printers are in the stone age -- needs open plastic, high-temperature beds, high-temperature head -- the full chain of machines from shredder to printer
- Any thermal plastic, any mix, -- what's the strategy?
- 1.8 mm nozzles - more surface area, stronger, faster print
- Metal rods on stepper motors penetrating chamber may be the easiest
- glass fibre blanket has melting point at 1000C ; rock wool? Regular house insulation
- Treadmill motors $50 for 3HP
- Counter weights?
- 60C is the limit on stepper motors
- As simple as possible, but no simpler ~Einstein

- The chamber has to be 2x the bed, frame is larger still -- but we have scalable price & tech
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Step 9. Plan

- Collaboratively fill out the tasks and assignments (see https://docs.google.com/presentation/d/1mIGz7FIA49g7B_kuAKjXG_Eh9k4H39cUN-lAlD7-SmA/edit#slide=id.gb328b2d63d_0_9)
- Log times and activities

Stage 2: Performing the Learning

Step 10. Model

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Step 11. Think critically

List Critical Thinking Questions

- What order do things need to happen in? Have we captured it?
- How do we perform as a group? What did we do well? What could we do better next time?
- How do we know if we have all the things we need for the HeroX challenge?

Step 12. Transfer / Generalize

- Is this a repeatable process? WHat do we need to generalize to make it repeatable?

Step 13. Solve Problems or Complete Tasks

- Execute per the plan we developed, tracking work, documents, and link from log

Stage 3: Assessing and Building New Knowledge

Step 14. Self-coach

Step 15. Document Gems & Deliberately Practice Your Knowledge

- Use of "what's in it for me" as a challenge design principle
- Collaborative planning among the people who will do the work gets work done
- Having a wiki tool ensures documentation record, google docs ensures synchronous collaboration, and logs help with coordination

Step 16. Create a Project

- The real project is the HeroX Trash2Home challenge