PAINSTORMING IN-CLASS ACTIVITY #3

Identifying the Hidden Opportunities: The Value of Observation

Instructor Notes on Lesson

Expected Time: 50 minutes

When to Implement: Painstorming, being an opportunity recognition methodology, should be introduced earliest in the semester as a way to identify problems worth solving. The Painstorming video should be shown first and this would be an appropriate in-class activity to immediately follow. If the other provided in-class activities are to be used, this should be used last.

Class Set-Up: Teams of approximately 4 where individuals will be able to work individually, with a partner, and as a team throughout the activity.

Materials Needed:

- Minimally, the instructor will need a computer connected to a classroom projector, however it may be beneficial for all students to have their own laptop for working with the materials at their own pace.
- The prepared powerpoint "Camping Out" and the accompanying video "Camping Out" will also be utilized during this activity. Instructors may wish to review these prepared materials and modify these to better reflect a topic more in-line with their course.
- A student handout has been created and can be distributed to help structure the activity worktime, though scrap paper can also be used.

Learning Outcomes:

At the completion of this activity, students will be able to:

- Compare and contrast three different "levels" of painstorming approaches
- Discuss the added value of incorporating diverse perspectives into the painstorming process
- Select and apply the appropriate level of painstorming to design problems based on scope and time constraints

Instructor Guide:

After watching the Painstorming video, putting the class in teams of 4, and handing out the activity packet or asking students to get out their own note sheet:

INTRODUCTORY DIALOGUE:

Explain to the class that painstorming can be done at varying levels. As the Painstorming video states the most effective way to painstorm is by observing multiple times, and with a diverse team, a videotaped scene showing an environment, interaction, or product in use. This gives us the opportunity to look for the most hidden opportunities and gets the inputs of others who might see different things from their perspective.

Explain to the class that this though sometimes isn't practical, especially in the scope of a smaller project or one with a shorter timeline or smaller budget. There are other ways to still use the painstorming methodology in more simplistic ways

The activity that will be done today will be a chance to practice painstorming at these different levels and this will give the class to see how these different methods compare and contrast.

The topic for painstorming today will be a broad one that will be familiar to many people --- problems encountered when "camping out".

Part 1. THE BUG LIST – Low Level Painstorming [12 minutes]

- Briefly introduce the idea of the Bug List to the class: The Bug List is an easy, low-level way to painstorm. It can be done individually but is more effective when done with others. The process is simple: The topic is presented and then each person (or team) thinks about the topic and comes up with a list of things that "bug", "annoy", or "frustrate" them about experiences/interactions/uses relative to the topic. (Some people find the bug list to be too pessimistic; an "I wish…" list can also be used) [2 minutes]

- Ask the class for some initial thoughts on what the pro's and con's of using such a low level methodology are. These will be revisited later in the activity, but it is worth getting students thinking of this. Typical responses might include: Pro's – Simple, No video necessary, Quick, We have some good ideas; Con's – What if I've never experienced that problem; Only those most obvious things; Limited perspective [1 minute]

- Assign students to individually list all of the things that bug, annoy, or frustrate them about going camping. [3 minutes]

- Have students form pairs. Tell students to discuss and keep adding to their lists. [3 minutes]

- Have each pair pick the item on their list that they feel presents the best opportunity to pursue (solve). Remind them that there are different reasons something might be the best opportunity (e.g. a problem that affects numerous people; a problem that doesn't affect many people but is very significant; an opportunity that opens up new markets; something no one else will think of, etc.) [1 minute]

- Lead a short report out and document these on a white board or post-it note sheet. [2 minutes]

Part 2. GUIDED PHOTO PROCESS – Medium Level Painstorming [20 minutes]

- Briefly introduce the idea of this process to the class. This process is more structured and guided than the Bug List. Here the topic is broken down and photos are presented representing the various potential elements of the process. In this example it has already been done, but for students wishing to use this process in their own open-ended problems they would be the ones needing to take the time to think through the break down and collecting the photos that will help them do the activity. [2 minutes]

- Ask the class for some initial thoughts on what the pro's and con's of using such a low level methodology are. These will be revisited later in the activity, but it is worth getting students thinking of this. Typical responses might include: Pro's – Start thinking about the whole process; Able to observe from the photos; Can be prepared from internet photos; Con's – Takes a while to put together; Limited interactions shown; Requires inferences on what is happening [1 minute]

- Show the "Camping Out" Powerpoint on the classroom projector. Stop at each slide and allow students to individually write a few problems/opportunities that they notice on their handout or notesheet. Stop at the blank slide in the presentation. [6 minutes]

- Optional: Let students form teams of four and use their own computers to review the slides and discuss, writing down their new ideas on their handout or notesheet. [4 minutes].

- Briefly tell the class that the images you pick and the perspective you are coming into this activity with greatly influence the pains/opportunities that are identified. Tell them that they will purposefully have to seek out other perspectives --- both in the photos they include and in the individuals that they discuss with. Continue onto the remaining PowerPoint slides that seek to "mix things" up a little. Have students add to their lists. [4 minutes].

- Have each pair pick the item on their list that they feel presents the best opportunity to pursue (solve). [1 minute]

- Lead a short report out and document these on a white board or post-it note sheet. [2 minutes]

Part 3. VIDEO BASED OBSERVATION – High Level Painstorming [16 minutes]

- Briefly remind students that as the video described painstorming is most effective when watching, ideally multiple times, and ideally with multiple people, a videotaped scene showing environments/interactions/use. Sometimes the students will have to film this video (permission will likely need to be granted before doing so!), but other times the video will already be available. [1 minutes]

- Ask the class for some initial thoughts on what the pro's and con's of using such a low level methodology are. These will be revisited later in the activity, but it is worth getting students thinking of this. Typical responses might include: Pro's – See the entire process; best reveals hidden opportunities; can be specific to the environment/product Con's – Takes effort and permission to obtain video; Likely only one piece of the larger process (5 minute video not days of video); Depends on knowledge of who is watching [1 minute]

- Show the "Camping Out" video on the classroom projector. Have students make notes on their handouts or note sheets throughout the process. [5 minutes]

- Optional: Let students form teams of four and use their own computers to review the video and discuss together, writing down their new ideas on their handout or notesheet. [6 minutes].

- Have each team pick the item on their list that they feel presents the best opportunity to pursue (solve). [1 minute]

- Lead a short report out and document these on a white board or post-it note sheet. [2 minutes]

Part 4. Assignment and Discussion

To wrap up this activity, instructors may wish to do one of the following:

- Have students individually, in pairs, or in teams complete the short in-class wrap-up handout. [5 minutes] follow this up with brief discussion relating to the questions on the handout. From the instructor's perspective try to get the class to see the value of each approach and when (within the class context and in future engineering contexts) they might use each one. [5 minutes]

OR

- Have students individually complete the accompanying Painstorming Homework 3 assignment packet. After the assignment is complete, debrief the assignment with the class at the start of a future class session.

Name: _____

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NOTESHEET TO ACCOMPANY IN-CLASS ACTIVITIES

Part 1. THE BUG LIST – Low Level Painstorming

Notes on what the Bug List is and how it is used:

Pros of the Bug List:

Cons of the Bug List:

Activity – When your instructor tells you, create your Bug List here:

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Part 2. GUIDED PHOTO PROCESS

Notes on what the Guided Photo Process is and how it is used:

Pros of the Guided Photo Process:

Cons of the Guided Photo Process:

Activity – As your instructor goes through the PowerPoint, list the problems/opportunities you notice here:

Logistics: Planning When and Where

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Packing for the Trip

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Setting Up Camp

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Preparing Meals & Eating

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"Living" at the Campsite

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Living out of a Tent

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Toileting and Bathing While Camping

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Nighttime at the Campground

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New ideas you had when your instructor introduced the slides that got you thinking in new perspectives:

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Part 3. VIDEO BASED OBSERVATION – High Level Painstorming [16 minutes]

Notes on what the Video Based Observation is and how it is used:

Pros of the Video Based Observation:

Cons of the Video Based Observation:

Activity – As your instructor plays the video, list the problems/opportunities you notice here:
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WRAP-UP

1. When is using painstorming an appropriate method in engineering design?

2. As an engineer you will encounter a number of different types of projects. What will you consider in deciding which level of painstorming you might use?

3. Throughout this activity you did some work individually and then were able to discuss in pairs or teams. Discuss what you noticed about the problems/opportunities you included in your list when you created the list by yourself versus with others. Which list did you feel gave you the most value ideas to pursue?

4. For each level of painstorming, you reported out the idea that you felt was most valuable to be solved. Which level resulted in the idea that you think was the most valuable of three? What do you think helped make this idea so valuable?

5. During the Guided Photo Process, your instructor showed you images that were meant to get you thinking from a different perspective. Did seeing the new images help you add valuable ideas to your list that weren't already there? Why do you think this was effective and what is something you could do in the future during similar activities to make sure your team thought this broadly?