Influences of Feedback Interventions on Student Ideation Practices

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Successful ideation involves both divergent and convergent thinking.
Divergent Thinking

DIVERGE

CREATE CHOICES
Convergent Thinking

Diagram:
- Converge
- Make Choices
DESIGN INSTRUCTORS GUIDE
DESIGN THINKING AND DESIGN PATHWAYS
Why did you go about it that way?

Have you considered...

This isn't good enough...

What about this or this or that?

What are your options?

I would do this instead...

I like how you...

This needs attention...
What guidance is provided for idea development during feedback interventions?

How does feedback impact ideation pathways of students? How did type of feedback suggest convergent or divergent (or neither) types of design thinking?

What similarities and differences are evident in feedback across disciplines? Are there discipline-specific strategies?
<table>
<thead>
<tr>
<th>Discipline</th>
<th>Students/Teams</th>
<th>Instructors</th>
<th>Duration</th>
<th>Feedback Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dance Choreography</td>
<td>2 students</td>
<td>4 instructors</td>
<td>4 months</td>
<td>3</td>
</tr>
<tr>
<td>Industrial Design</td>
<td>7 students</td>
<td>1 instructor, 3 clients</td>
<td>2 months</td>
<td>5</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>3 teams</td>
<td>1 instructor</td>
<td>4.5 months</td>
<td>2</td>
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1. What guidance is provided for idea development during feedback interventions?

2. How does feedback impact ideation pathways of students? How did type of feedback suggest convergent or divergent (or neither) types of design thinking?

3. What similarities and differences are evident in feedback across disciplines? Are there discipline-specific strategies?

626 pages of transcriptions
1. What types of feedback were given?

14 types of feedback were observed among the three sets.

2. Did the feedback suggest convergent or divergent thinking?

7 of them suggested convergent thinking
3 of them suggested divergent thinking
4 of them were non-directional

3. What similarities and differences exist across disciplines?

6 of them were observed in CH, ID, and ME
4 of them were observed in CH and ID
4 of them were observed in ID
<table>
<thead>
<tr>
<th>Feedback Types</th>
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<tbody>
<tr>
<td>Direct Recommendation</td>
</tr>
<tr>
<td>Draw Comparison</td>
</tr>
<tr>
<td>Elaborate</td>
</tr>
<tr>
<td>Evaluate Artifact Quality</td>
</tr>
<tr>
<td>Evaluate Progress</td>
</tr>
<tr>
<td>Interpret/ clarify</td>
</tr>
<tr>
<td>Explore</td>
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<tr>
<td>Focus on Design Main Idea</td>
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<td>Suggest multiple options to consider</td>
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<td>Seek Simplicity</td>
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**Divergence-leading Feedback**
- Explore
- Suggest multiple options to consider
- Seek inspiration

**Convergence-leading Feedback**
- Assess risk
- Direct recommendation
- Evaluate progress
- Interpret/clarify
- Focus on main idea
- Prioritize ideas
- Seek simplicity

**Non-directional Feedback**
- Draw comparison
- Elaborate
- Evaluate artifact quality
- Prototype/test
| Explore | Instructor suggests students consider multiple ways of achieving something that needs work. | Divergent Dance, Industrial Design |

**CH:** "So it’s important but to... play around with that. [W]hat are they... feeling when they do that? Is it like some kind of thing they just do or is it – are they having a secret whatever your story is."

**CH:** “Play around with different hands, um, so what is it to you?”

**ID:** “I would get a dowel rod and drill through all these and see what you think. And play with it. I think what's gonna happen though is this is your, your point of axis rotating here.”
**Suggest multiple options to consider**

Instructor suggests multiple ways the students might achieve a goal for a particular aspect of their design.

**Divergent**

**Dance,**

**Industrial Design**

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**CH:** “I would play with timing or direction or placement of the stage space or other ways to, uh, surprise us...”

**ID:** “Well, you know, again, there, you could even maybe, maybe this inner – the inner piece could be out of, ah done out of a different material. Who knows? Maybe that since it's small, and maybe it could be a bent plywood or something. I don’t know – what I like about this is you could change it out to different – potentially, to [clears throat] other materials and different combinations of materials.”
<table>
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<tr>
<th>Direct recommendation</th>
<th><em>Instructor tells students they should do a specific thing to improve their artifact</em></th>
<th><strong>Convergent</strong></th>
<th><em>Dance, Engineering, Industrial Design</em></th>
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**CH:** “Is there any way that her foot could pop out over a person’s shoulder up here?”

**ID:** “You may want to at that front lower point maybe a bigger radius on that. Right at the bottom.”

**ME:** “You might want to think about moving the pivot point to the center of pressure so that moment arm is reduced.”
<table>
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<tr>
<th>Evaluate progress</th>
<th>Instructor emphasizes the importance of time management and organization throughout the entirety of the project, and gives opinion on the progress and quality of student ideas</th>
<th><strong>Convergent</strong></th>
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**CH:** “You have to be done before Thanksgiving!”

**ID:** “We have a limited amount of time. All right?”

**ME:** “Why were we trying to get 'em last night as opposed to in the last three months?”
**Draw Comparison**  
Instructor describes other existing artifacts or **Non-directional** elements in nature that resemble student ideas.

**CH:** “that it reminds me of curlicue but it’s not, and there’s something like mother of pearl, like iridescent or something, about like the word, so um I was very charmed by the word and how it relates to what you’re doing. So that’s really nice.”

**ID:** “Okay. You’re still, depending on what your shape is, maybe your Hershey Kiss from the, from the front has a little bit more curvature, you know?”

**ME:** “So were we gonna finish the outside, paint it, make it look like a fish?”
Elaborate  

Instructor has students consider aspects of their design that have previously been unspecified by providing details about mechanisms, materials and manufacturing technique to realize the concept in real life.  

Non-directional  
Dance, Engineering, Industrial Design

CH: “…and you can maybe articulate your idea more that way by thinking about those elements, the essence of each of those ideas and then we’ll see more you know distinguishing characteristics of that.”

ID: “Now this might be hard for them to manufacture- you have to think about that.”

ME: Looking at that servo again... You might check that... with the relative position, and I realize the picture might not be accurate... But it looks like in an extreme location, I don't think it's going to work, but just check it to make sure.”
SIMILARITIES/DIFFERENCES ACROSS 3 DISCIPLINES
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• Modeled receiving feedback as they were designing alongside students

• Most frequent feedback evaluated quality (non-directional)

Followed by suggestions to:
  • Explore (diverge)
  • Direction recommendation (converge)
Industrial Design

- One-on-one mentoring as the basis for feedback sessions. Used convergence and divergence in combination.

- Most frequent feedback types were
  - Explore (diverge)
  - Elaborate (non-directional)
  - Evaluate progress (convergent)
• Session functioned more of a presentation of decisions and progress than feedback

• Most frequent feedback was interpretation
  – Instructor wanted students to clearly explain and justify choices made
Questions for Design Education

What goals exist in different feedback contexts? How do instructors align the feedback they give with these goals?

I want my students to consider many options...
Suggest ways for students to expand their perspectives and explore

I want my students to make decisions...
Suggest ways for students to gather and use data to inform decisions

How are both convergence and divergence encouraged at multiple times throughout design processes and for important design decisions?
Thank you!

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