What Kind of Place Is School to Learn? A Comparative Perspective From Students on the Question.

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Abstract: In 1972 Howard Becker argued that "school is a lousy place to learn anything". However, Becker's analysis was based on a comparison of ethnographic studies of on-the-job learning with an ideal typical representation of school. This paper revisits the issue of whether and how schools may be a lousy place to learn by listening to and interpreting the perspectives of students themselves. We draw on a sample of 300 interviews with students conducted in the context of researching what and how students learned in a program called FUSE Studios, which we have previously conceptualized as "an alternative infrastructure for learning in schools". We asked students whether and how FUSE was different from their other classes, and their responses provided us with a unique window into what students think of school as a learning environment. Herein, we share their perspectives and draw implications for future learning sciences work.

Introduction

In 1972 Howard Becker argued that a "school is a lousy place to learn anything" (Becker, 1972). Becker's analysis was organized around a comparison of ethnographic cases of on-the-job learning (including his own) with what he acknowledged as an *ideal typical* representation of school. The logic of Becker's analysis was based on one that has become not uncommon in the learning sciences. That logic says that "if students do not learn what the schools propose to teach them" (Becker, 1972: 86), it is at the same time the case that people do learn any and all manner of things, so we ought to seek out and study those contexts where learning does happen. These contexts are often filed under the bulging residual category of 'informal learning'.

Becker's analysis has mostly been ignored in educational research and there is a reasonable basis for ignoring it. First, Becker's argument is largely systemic and structural, not unlike the arguments made by Varenne & McDermott (2018); Becker was not arguing this particular school or classroom is a lousy place to learn for equally particular reasons (e.g. a bad teacher, faulty curriculum, or unmotivated students) but that it is the "very organization" of schooling that "produces its failures" (p. 85). This systemic argument might seem to make the enterprise of trying to improve schooling incrementally, while holding the fundamental model constant, look like a fool's errand. Another reason why Becker's argument may have been easy to ignore is that, while the characterizations of on-the-job learning had an empirical basis in ethnographic fieldwork, his characterization of schooling was an ideal typical composite, in other words, arguably, a stereotype. While Becker did cite a number of empirical studies that showed how schooling did not produce its desired learning outcomes, the asymmetry of the empirical basis in his analysis makes it easier to ignore. What is now harder to ignore, after a few decades that have produced a growing corpus of studies that display a wide variety of distinct and effective ways of organizing learning environments differently than schools (e.g. Lave & Wenger, 1991; Paradise & Rogoff, 2009) is Becker's central comparative *question*. Are schools really lousy places to learn? Compared to what? How in particular do the innovative learning environments that our community creates compare to the standard models of school-based learning environments? And how should we construct an informative comparative analysis?

This paper addresses the comparative question and approaches it a surprisingly uncommon way. Since the primary people who meant to learn in schools are students, we decided to ask *them* the comparative question directly. This paper's comparative analysis emerged within a multi-year design-based implementation study involving the creation, refinement, and implementation of what we have previously called 'an alternative infrastructure for learning in schools' called FUSE Studios (Stevens et al, 2016). FUSE is currently implemented in 200 US and Finnish schools, serving approximately 25,000 students. As part of our multi-year research project, we interviewed students at length about their experience in the program and these interviews included questions asking them to compare their experience in FUSE to their experience in other classes. The idea of listening closely to and studying students' understandings and responses to school experience is one that has a firm place within a literature associated with the terms 'voice and choice' (e.g. Thiessen & Cook-Sather, 2007), but this literature seems surprisingly to exist largely outside the citation base of the learning sciences. In this paper, we argue that it is important to understand students' perspectives and lived responses a) to the standard model of education and b) to the innovative learning environments that learning scientists create and

implement and c) to understand how students *comparatively* understand these distinct ways of organizing learning environments.

Method

Research context

The interviews with the more than 300 students that furnish the data for this paper were collected in a particular set of circumstances that is important to understand. Students were interviewed as part of a sequence of NSF-funded projects that extends over 6 years. These research projects have had as their goal understanding what and how students learned in FUSE classrooms. Much of the research conducted in these projects has been video-based, ethnographic studies of students' learning and interest development over time. To complement these methods, we also asked students directly what they thought about their experience in FUSE what they liked, what they did not like, and what they thought they learned as well as *how* they learned in this environment. We also posed a comparative question to them directly—in essence putting the comparative analysis of the kinds previously conducted by Becker in the students' own hands. We use the qualifier "partially" because, of course, we have participated in this analysis by selecting, coding, and analyzing transcripts of these interviews in what follows. We posed two variants of the same question to the students as part of a longer interview of between 13 and 22 questions. The more recent variant of the question that we asked the students was, "Is FUSE different from your other classes?" If a student answered "yes", we asked them how it was different. The earlier variant of the question was posed more specifically. We asked, "Is FUSE different from math and science class?" The follow-up, if a student response was "yes", was again to ask them to elaborate on how they saw it so.

In a range of other publications, we have analyzed and documented the emergent features what students learn, how their interests develop and, in general, all aspects of the student experience in FUSE classrooms. For the most part, we will not extensively describe these findings, but a minimal description seems warranted to the give readers a sense of students' bases for identifying differences. The program's core activities are a set of 30 or so challenge sequences, composed of challenges in STEAM areas, with a particular focus on activities related to central letters of the acronym—Technology, Engineering and Arts (TEA). Challenge sequences are composed of between three and eight challenges and they are designed to level up like video games. After a student (or students working together) complete a challenge, they upload a picture or video documenting their completion of the challenge and then unlock the next challenge level. The challenges are designed to appeal to youth interests, and all challenges are introduced by a trailer, just like commercial video games and movies have trailers. Some of the challenges are purely digital (e.g. designing your "dream home" in Sketch-up), while others are entirely tangible (e.g. designing a roller coaster with simple materials to achieve certain functional requirements). Still others involve a hybrid of digital and tangible work (e.g. numerous challenges that involve 2-D digital design and then 3-D printing of those designs).

Among the primary reasons we call this an alternative infrastructure for learning in schools is that students have choice in multiple dimensions. They can choose which challenge sequences to start, whether to continue with a particular challenge or to another level within a challenge sequence; they can also choose whether to work alone or with others. As a result, unlike traditional curricularly-organized classroom activities, students are working on different challenges at different times at different paces. Another major difference is that challenge work is not graded. A core principle of FUSE is that "failure is just another try" and, by design, just like in video game play, not succeeding at a level should be an invitation to try again and try differently. Assigning a bad grade for a failed level would be a disincentive for students to try again. (With regard to grades, because this program is run as a regular class in public schools, teachers are typically, but not always, required to give summary grades at the end of a marking period; our design team has worked with teachers to find ways to do so that don't threaten the integrity of the overall experience for students, though this remains a work in progress. Finally, the roles of the teacher and students are reimagined and reorganized in FUSE. The website is where students keep track of their own progress and where students find different kinds of support material (e.g. about ten help videos per challenge sequence) for their challenge work. These materials along with other students are the primary teaching resources in these learning environments. Because students pursue challenges at different paces and to different levels, they become the 'relative experts' in the room, and because there is no penalty for helping others (i.e. it is not regarded as cheating and students are not competing with each other for a limited number of good grades), students naturally help each other learn, not unlike what is common among video game players (Stevens, Satwicz, & McCarthy, 2008). This unburdens the teacher (who is called a 'facilitator' in the language of the program) from having to "know everything" and "teach everything", and they can instead play a variety of other roles; they encourage, they connect, they advise, and they collaborate in a more peer-like way, not unlike the undergraduate facilitators in one of FUSE's design inspirations—the Fifth

Dimension (Cole, & Distributive Literacy Consortium, 2006).

Data collection

We drew on two specific data sources for this analysis. One of those is an ongoing NSF-funded research project aimed at understanding how the particular educational innovation of FUSE gets into, gets rooted within, and spreads to new schools (Stevens et al., 2018). In this project we drew on data from 57 schools implementing FUSE as a new program during the 2017-18 school year. From this set of 57 schools, we selected 17 focal schools for close analysis, which were representative of the larger dataset in terms of both school characteristics and proposed ways of implementing the program. Of these, three were elementary schools, nine were middle or junior high schools, two were high schools, two were combined elementary and middle schools, and one was a combined junior and senior high school. Four were located in the Northeastern United States, three in the Midwest, seven in the Southeast, and three in the Southwest. Five were located in major urban school districts, seven in minor urban school districts, and five in the suburbs. All were public schools, although three were public charter schools and six were magnet schools. The schools varied widely in the how the students identified racially; the percentages of self-identified under-represented minority (URM) students served by our focal schools (M=47%, SD=27%) ranged from relatively low percentages of URM students (e.g., 16 percent) to schools that served almost exclusively URM students (e.g., 98 percent). Similarly, the numbers of low income (FRL) students served by our focal schools varied widely (M=51%, SD=26%), with some serving relatively low numbers of FRL students (e.g., 13 percent) while others served exclusively FRL students (e.g., 100 percent). From these 17 schools, we interviewed 255 students. Of these students, 63 were elementary school students (Grades 4-5), 165 were middle school students (Grades 6-8), and 27 were high school students (Grades 9-12).

The second interview data set comes from an earlier research project, focused on understanding the student learning and interest development in FUSE. This project's primary data were longitudinal video recordings, complemented by these interviews. All of the students who participated in the interviews were also part of the video-ethnographic part of the study, and our findings across analyses of both data sources are consistent. In this study, we interviewed 57 students who had participated in FUSE during the 2015-16 school year in one large, suburban, Midwestern school district. This district was the first to implement FUSE as an in-school program and the first to implement it district wide. The 57 students interviewed during this phase of our multi-year research project were from seven classrooms in three K-6 schools in this district. All of these students were in grades 5 or 6.

Findings

Here we present evidence of student perspectives on the differences between FUSE and other academic classes in school. We do this in two ways. First, we present a synoptic table (See Table 1) that includes analytically generated codes such as "In school, the teacher tells us what to do", along with response percentages (from each of the datasets, representing answers to slightly different questions) and examples of student quotations. To produce this table, we used a standard grounded theory approach (Strauss & Corbin, 1987) and open coded interview responses to identify themes and then iterated on those codes. This table is based on an analysis of all 305 interviews and speaks to the generality of student's perceptions of how regular classes and FUSE class are different. At a top level, we note that nearly all the students saw regular classes and FUSE as different (98%/88%); the students then went on to identify various differences.

Table 1: Responses to the Questions: "Is FUSE different from your other classes? "How?" (Dataset 1) and "Is FUSE different from math and science class?" "How?" (Dataset 2)

Response Category	% Responses Datasets 1, 2	Example Student Quotations
Yes	98%, 88%	"Yes", "Definitely", "Yea", "Very Different"
No	2%, 12%	"No", "Not really"
In school the teacher tells us what to do	43%, 21%	"Usually we would have a teacher dictating us telling us what to do, this is what you will do, but in FUSE we get to decide what projects we want to do, when we want to do them, how long we're going to take."
School isn't hands-on	37%, 25%	"Yeah, because my other classes we just basically like sit there and then like have the teachers do it for us, but then in FUSE we get to do ourselves like hands-on activities."
In school we use books but not computers	38%, 35%	"In FUSE you use computers. In science we just use textbooks." "It's more of a hands on thing, because like in other classes, we have to do Cornell notes, and just all that leading up to leaving class and then coming back the next day and finishing

		up Cornell notes and just not really doing anything, but here we actually get to do it as soon as we want."
School isn't fun	14%, 21%	"Yea, because in science we have to take tests, and it's not fun."
School isn't collaborative	9%, 0%	"…we got to like interact with other students. Normally in other classes we just sit there and do work."
School is boring	10%, 7%	"Yea, our other classes are kind of like boring, and it's just like work after work after work, but this class is like you can like work at your own pace and do what you like."
School has lectures	6%, 0%	"There's typically no lectures in FUSE."
In school you're not free to move	6%, 0%	"…in FUSE you're free to move around the room…"
No engineering in school	5%, 12%	"Yeah, we don't do a lot of um, engineering or like building in [other classes]"
In school, subjects are siloed	4%, 11%	"Yes, because in a lot of my classes they're just one thing, but in FUSE there's everything. So, there are things that have to do with music and math and science, all that stuff, but like in my other classes, it's just one thing, but in here I do I can do, you know, everything."
School isn't creative	4%, 7%	"FUSE is different, because it's a little bit more creative than most of them."
School has homework	4%, 0%	"Yes, well for starters there's no homework."
School involves tests and grades	4%, 4%	"In other classes like you have tests, but in here it's just the challenges, and that's a bit more fun."
School is stressful	3%, 2%	"Well, yeah, because…you would get stressed in math. But over here you have the whole time to just enjoy on the computer and just make stuff."
School is easy	3%, 0%	"FUSE, yes, it's very different, one because it's more fun, and it's not easy, like it's not very easy, like most of the classes are."
School isn't useful	3%, 0%	"In FUSE instead of like doing worksheets we're working on the computer on something that we can actually like use afterward."
School isn't visual or spatial	3%, 0%	"For sure, because like math and stuff you're just like sitting down and stuff and FUSE is really like visual and hands on."
School penalizes failure	2%, 0%	"In my other classes you have to like, there has to be like a right answer and like you always have to like worry about your grade and what you're going to get, but in FUSE you can just pace yourself and do whatever you want and it doesn't matter like if you get it right or wrong."
School has deadlines	2%, 0%	"In FUSE you're focused on what your challenge is. And you're not focused on like, oh this is a grade, or oh, I have to get this done now."

The second way we represent the students' perspectives is to provide more extended transcripts from four interviews that are representative of our full set of interviews. We analyze parts of these interactions to display how students talked about their regular classes in relation to FUSE and to draw attention to some of emotionality in their responses that is lost in frequency counts and isolated quotations.

In Interview Excerpt #1 (see Table 2) fifth grader, Liam, volunteered that he was not able to do the FUSE challenges at home. Because none of the FUSE courses assign homework, we interpret this to represent both that Liam was sharing his desire to continue his work on the challenges at home but also his frustration that he could not, for lack of needed "stuff" (e.g. computational devices like Arduinos). He then posed an ironic juxtaposition—that he was "only able" to do these activities that he enjoys "in almost one of [his] least favorite places in the world" (Turn 8), a phrase that he accompanied with a knowing smirk to the researcher. In response to the researcher's request for clarification, he identified this almost least favorite place with an indexical phrase (i.e. "right here") and pointing gesture to the floor (Turn 10). On the basis of this interactional evidence, we interpret this as a reference to school. It is notable also that he did not explicitly say "school" and that in both this characterization and his identification of "right here" that he lowered his volume, perhaps for fear of being overheard by a school official. The researcher followed up and asked him why "this" was one of [his] least favorite places in the world, and he said, "because I can never just do what I want to" (Turn 12). He then dramatized what school is like, depicting a tedious list of anonymous tasks (Turn 14). At the end of the segment, he made a direct comparison between how [program name] and school feel to him, saying that [program name] feels "more like a game" (Turn 18) than like school.

Table 2: Interview Excerpt #1

Turn	Speaker	Talk	Action
1	Researcher:	Um, so what's it like to work in FUSE?	
2	Liam:	[1]:::It's a little challenging, can drive me nuts:: a:::nd it's very fun	*[1]Tilts head to side, looks at ceiling.*
3	Researcher:	[1]Mmm hmm	*[1]Nods.*
4	Liam:	[1]tho::ugh it requires some stuff that we:: don't have at my house. So I can't do it there.	*[1]Looks at researcher.*
5	Researcher:	Oh, okay, okay.[1]	*[1]Nods.*
6	Liam:	[o]So, yeah[o].	
7	Researcher:	Alright.[1]	*[1]Nods, looks down at notes.*
8	Liam:	I am only able to do it at[1] [o]a::lmost[2] one of my least favorite places in the world[o].	*[1]Looks up at ceiling. [2]Glances sideways at researcher and smirks.*
9	Researcher:	[1]Oh, which is where?	*[1]Smiles, looking back at Liam now.*
10	Liam:	[1][o]Right here[o].	*[1]Points down at classroom floor.*
11	Researcher:	[1]And why is this one of your least favorite places.	*[1]Laughs.*
12	Liam:	[1]Because I can[2] never just do what I want to.	*[1]Leans head back. [2]Leans head forward, shakes head, no longer smiling.*
13	Researcher:	[1]Mmm hmm	*[1]Smiles.*
14	Liam:	[1]I always have to do [2]this and do [3]that and do [4]this and [5]scribble out this and that.[6]	*[1]Opens eyes wide and smiles again. [2]Points to his left. [3]Points to his right. [4]Points to his left. [5]Pretends to draw in the air. [6]Looks down, sighs.*
15	Researcher:	Mmm hmm, so do you feel like FUSE is like that?	
16	Liam:	[1]No.	*[1]Looks up at ceiling, shakes head, looks down again.*
17	Researcher:	Okay, so how is FUSE different?	
18	Liam:	[1]U:::mm [2]for me it feels more like a game than a:: [3]like school.	*[1]Looks up at ceiling. [2]Looks down at his hands. [3]Looks at researcher.*

In Excerpt #2 (see Table 3), fifth grader, Amadia, answered the researcher's comparative question in a way that initially seemed that she did not see differences between math and science class and FUSE. She said, "actually, it kind of isn't" (Turn 2). However, what followed clarified that she saw FUSE as about math and science—thus the basis for saying that they are "kind of" not different—but she went on to offer a comparative perspective on how *very* different they were to her. Whereas she saw FUSE as having been created "so that we can be interested in math and science and us not knowing we're interested in it", "those classes" (i.e. math and science) were classes where "most of us get bored" (Turn 2). The researcher asked directly why those classes were boring and she said it was "because the way that they teach". Then, she quickly seemed to generalize to the reason being that they were "teaching it to us" (Turn 4). She then added an exemplifying vivid detail, recounting having once seen a student sleeping in one of these classes. Then, the researcher took Amadia to have been implying that FUSE is not boring, which she implicitly confirmed by positively characterizing it as "fun" and giving a specific example of one of the things she did in a digital animation challenge (called MiniMe).

Table 3: Interview Excerpt #2

Turn	Speaker	Talk	Action
1	Researcher:	How is FUSE different from math and science class?	
2	Amadia:	[1]U:::h, actually, it kind of isn't. But, most of us get bored in those classes, but [2]they made this::It's kind of like it, so they just made FUSE so that we can [3]be interested	*[1]Glances at researcher, then looks up at ceiling. Fidgets with hands and feet. [2]Looks back at researcher. [3]Holds both hands out to her right. [4]Looks at researcher and brings*

		in math and science and [4]us not knowing we're interested in it.	*hands down and to her left, making pinching gesture with her fingers.*
3	Researcher:	Why are math and science boring?	
4	Amadia:	[1]Because the way that they teach, that they're teaching it to us. Everybody's always bored. Not to lie, but I actually think that I once did see someone sleeping.	*[1]Looks at computer screen (away from researcher).*
5	Researcher:	How is FUSE not boring?	
6	Amadia:	They give us a lot of different challenges and things to do, like uh that MiniMe. It's fun, because you can put the little character in different, in different poses to make him look weird.	

In Excerpt #3 (see Table 4), seventh grader, Xavier's, response to the comparative question about whether the classes were different was emphatic, both in tone and wording—"YES DEFINITELY" (Turn 2). He then went on to elaborate on earlier points he had raised in the interview about how in other classes he and his classmates were effectively bound to their desks for individual seat work, which he communicated with the repetitive sequence "desk, desk, desk" and a frown (Turn 4). He continued with the comparison, saying that in other classes "you barely get a chance to like interact with others. But like with this class it's just HANDING YOU the opportunity to work with people and like…meet new people" (Turns 4 and 6).

Table 4: Interview Excerpt #3

Turn	**Speaker**	**Talk**	**Action**
1	Researcher:	Um, is FUSE different from your other classes?	
2	Xavier:	[1]YES, [2]YES DEFINITELY[3]	*[1]Looking down at palms. [2]Looks up and sideways at researcher, smiling. [3]Looks around room then back down at palms but continues to smile.*
3	Researcher:		*Smiles, laughs.*
4	Xavier:	Because like, like I said earlier, it's just, most of the classes, it's just like [1]desk desk [2]desk like you're just[3], it just feels like you're by yourself. It's just like you just have your [4]notebook and your [5]pencil and you're just [6]writing notes and that's all.[7] And like you barely get a chance to like [8]interact with others. But like with this class it's just [9]HANDING YOU [10]the opportunity to [11]work with people and like	*[1]Frowns, gestures with hands together in lap, palms up, like he's holding something to one side. [2]Gestures with one hand in lap, palm up, on the other one side. [3]Shrugs slightly. [4]Holds right hand out like he's holding a notebook. [5]Holds left hand up like he's holding a pencil. [6]Holds right hand up and pretends to scribble in the air. [7]Drops hands to lap and lowers head, frowning. [8]Drops hands and head lower, frowning more. [9]Brings hands together, palms up and pushes them outward like he's holding something and handing it to someone. [10]Looks at researcher. [11]Brings hands up, palms up and moves them apart.*
5	Researcher:	Mmm hmm	
6	Xavier:	[1]meet new people.	*[1]Brings hands together in lap and looks at researcher.*

In Excerpt #4 (see Table 5), eleventh grader, Becky, gave an initial answer to the comparative question that was affirmative (Turn 2). When asked to offer how she saw them as different, she packed quite of bit of comparison into one brief turn. In "most classes" students "just sit down and listen to teachers talk" whereas in FUSE "you're actually learning how to do stuff rather than memorize things that you don't need in life at all"

(Turn 4), a point she punctuated with a bewildered head shake. After the researcher laughed a little, she re-emphasized the final phrase "like at all" and continued to shake of her head (Turn 6).

Table 5: Interview Excerpt #4

Turn	Speaker	Talk	Action
1	Researcher:	Um, is FUSE different from your other classes?	
2	Becky:	[1]Yeah	*[1]Looks at researcher, nods.*
3	Researcher:	How, how so?[1]	*[1]Smiles.*
4	Becky:	[1]In most classes, you kinda just sit down and listen to [2]teachers talk [3]but like in this one it's very hands on so you're actually learning [4]how to do stuff rather than memorize things that you don't need in life [5]at all	*[1]Smiles, looks of toward camera. [2]Frowns and looks back toward researcher. [3]Looks back toward camera. [4]Looks back toward researcher. [5]Shakes head.*
5	Researcher:		*Laughs.*
6	Becky:	[1]like at all.	*[1]Continues shaking head and smiles.*

Space does not permit a full analysis of a more examples of interview transcript from research in the Finnish classrooms implementing FUSE, but at least some students there also appear to have comparative perspectives similar to the US students. In an answer to the very same question asked in the US research, one pair of Finnish boys answered the question in the following way (abbreviated Excerpt #5, below). After Tom states that FUSE and regular lessons are "so different" (Turn 5) in answer to the question, May explains that they are so different "freedom wise". What May seems to be saying—as interpreted by our Finnish colleague—is that while normal lessons are often represented as if they offer experiences to "let your imagination run wild" they are in actuality substantially constrained by "this, this, this…" (Turn 6), whereas their experiences in FUSE realize this kind of desirable freedom.

Table 6: Excerpt #5

5	Tom:	Ne on ihan erilaisia	*They are so different*	
6	May:	=Se on ihan erilaist niinku vapauden kannalt koska yleensä oppitunti jakai tai rajautuu PÄÄSTÄKÄÄ[1] MIELIKUVITUKSENNE VALLOILLEEN[2] sitte (1.0) ei saa olla sinistä taivasta eisaaolla sitä ei saa olla tätä >pitää olla totototototototo<	*It is so different like freedom wise because normally lessons are div- or limit LET[1] YOUR IMAGINATION RUN WILD[2] and then (1.0) you can't have blue sky you can't have this you can't have that >you have to have this, this, this, this this, this, this, this<*	*[1]hands sway in an opening movement, [2]hands come to rest at side*

Discussion

We framed this paper against the backdrop of Howard Becker's provocative claim from nearly a half century ago that schools are a lousy place to learn anything. Becker was not talking about particular schools; he was making a structural argument, about how the "very organization" of schooling "produces its failures". Arguably most schools are still largely organized in the ways that Becker described and thus remain relatively lousy places to learn. At the same time, design-based initiatives from the learning sciences and other sources of innovation have experimented with different ways of organizing learning in schools, especially at the classroom level. This is what the FUSE team sought to do, deliberately altering the "very organization" of classroom culture in ways that we hoped, like all learning environment designers hope, would avoid those all too familiar failures and provide a more compelling learning environment. In the case of FUSE this has meant guiding the implementation of an environment where students are able and encouraged to pursue their own interests, assert

their own agency, and in general control their time, their activities, and their own bodies. Yet choice in FUSE still has limits—we call it a structured choice learning environment—with sequenced challenges in a broad thematic area of STEAM. As well, teachers have adapted to these environments and therefore participate in these environments very differently from how they participate in regular classes (Ramey & Stevens, 2020), but they are still ultimately in charge and when there are grades, it is still the teachers who give these out. So as dramatic as the changes to the infrastructure of classroom learning are in FUSE, other features of the experience are more continuous and familiar as 'school'. What then would students make of the whole package?

In our prior video ethnographic research in FUSE classrooms, we identified a set of emergent features of these environments that make them different from school as usual (Stevens et al., 2016; Ramey and Stevens, 2019; Hilppo and Stevens; 2020). This analysis complements those analyses. The research team decided to conduct these interviews, because we saw a need to 'walk the talk' of the project's core commitments; if youth interests and youth agency were at the center of our work, then we had to ask youth participants directly if and how well our design intentions had been realized in their perceptions of their experiences. We found a significant congruity of our design intentions and the perceptions of the students.

When talking about FUSE, our analysis suggests that students saw it as a less lousy place to learn than other academic classes in school, because they could work with and learn from their classmates, choose their own lines of activity, move about freely, and be engaged in making things and doing things that reflected their own interests, and that they enjoyed. The reasons students gave that regular academic classes were lousier were many. The most prominent reason that students gave was that school is a place where the teacher tells students what to do, rather than letting them choose. Not far behind among students' reasons given, in both frequency and fervency, was that what teachers in other classes required them to do was not interesting or enjoyable. Other reasons they gave about regular school classes included that they: (1) aren't hands-on; (2) involve note taking and book work, rather than work making things with their hands and with computers; (3) are boring or not fun; (4) aren't collaborative or creative; (5) involve lectures and being confined to one's seat; (6) silo the subjects and exclude others altogether (like engineering and design); (7) involve homework, tests, deadlines, and grades; (8) are stressful; (9) are too easy; (10) are not useful; and (11) penalize risk and failure.

We conclude with an analogy. Much of the focus of educational improvement is directed toward making education more 'nutritious', as measured by performance alignment with expert-generated consensus standards (e.g. NCTM, Common Core, NGSS, and ISTE). We believe that in addition to making education nutritious, it also needs to be delicious. The alternative, choice- and interest-based program in which these young people participated is an example of a way to provide educational experiences that are both nutritious and delicious. In general, we believe that future learning sciences research and design can benefit from better understandings of young people's perspectives of the learning environments we design for them, and hopefully soon, toward a common practice of designing *with them*.

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