education sciences

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Defining Rural: Rural Teachers' Perspectives and Experiences

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Abstract: Public agencies and other funding organizations have often defined rural in reference to "urban" and using parameters such as population density, access to cities, and distance to market areas. Using such definitions of rurality within the context of K-12 education as a way to support these systems is challenging because of the diverse geographic and socio-cultural identities of these places despite a common "rural" designation. This study aims to analyze elementary teachers' perceptions of their school context and role within that context to better understand the diversity of what it means to be rural. Semi-structured interviews with 3rd–5th-grade teachers (n = 35) were used. Data sources also included identity and community walk slides created by these teachers. Structured interview prompts were tailored to these activities. A priori and emergent coding analyses were used to examine teachers' conception of their rural context and their role within that context. The results show that rural, as defined by teachers, is a diverse and connected place in which diverse community assets support teachers in their instruction in unique ways. By better understanding the diversity of what it means to be rural, we begin to understand the ways in which context shapes experience and best determine how to support rural educational experiences for both teachers and students.

Keywords: rural education; context; diverse; connected; teacher perspective; rurality defined

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Citation: Inouye, M.; Macias, M.; Boz, T.; Lee, M.J.; Hammack, R.; Iveland, A.; Johansen, N. Defining Rural: Rural Teachers' Perspectives and Experiences. *Educ. Sci.* **2024**, *14*, 645. https://doi.org/10.3390/educsci14060645

Academic Editors: Yael Grinshtain, Tanya Ovenden-Hope and Jayne Downey

Received: 8 April 2024
Revised: 9 June 2024
Accepted: 12 June 2024
Published: 14 June 2024

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1. Introduction

Many scholars agree that there is no consistent definition of rural (e.g., [1,2]), and "the meaning and image of 'rural' varies considerably from place to place within and between countries" [3] (p. 82). Despite the diversity of rural areas, when defining rural, most studies employ the definitions of government organizations, which greatly differ based on population density, geographic features, economic development, and proximity to urban areas [4]. For example, the U.S. Census Bureau bases its definition on population size and density. The National Center for Education Statistics (NCES) categorizes rural areas based on their proximity to urbanized areas. Who falls within these statistics-driven definitions has huge implications for funding, access to resources, and availability of services for K-12 schools. Furthermore, these definitions are widely used in the literature, with some studies employing them specifically to highlight their focus on rural areas [5,6]. However, this presents many challenges associated with how we think about rural and many implications when these definitions determine access to funding and resources.

Public agencies and private organizations often define rural in reference to that which is not urban. For example, NCES designates three types of rural communities with fringe rural defined as "territory that is less than or equal to 5 miles from an urbanized area, as well as rural territory that is less than or equal to 2.5 miles from an urban cluster" [7]

(p. 1). The Census Bureau delineates rural as "any population, housing, or territory NOT [emphasis added] in an urban area" with urban areas being defined as an area with a population of more than 50,000 [8]. Within all of the places across the United States that fall under these parameters, there is great variability in geography, socio-cultural context and values, economic drivers, and school demographics. Therefore, there are limitations on the applicability of these definitions for all rural spaces because they misconstrue rurality as simply a location rather than a rich complex culture, way of life, and state of mind [9]. While this study was specific to the United States, it is useful to note that the definition of rural has also been a subject of debate in Indonesia [10], across Latin America and the Caribbean with recent attempts to generate new methods for defining rurality not based mainly on population [11], and throughout Europe where attempts have led to similar typologies based on quantifiable criteria [12]. By defining rurality through these governmental agencies, the voice of those who live in these areas and who work in these schools is ignored. We leave out the voices that make up these communities and their unique perspectives, experiences, and relationships with each other and that place. Most importantly, we leave out their needs.

As Hargreaves and colleagues [3] state, rural is both a structural and cultural concept that is multi-dimensional and encompasses the cultural dimensions and the perspectives of the people living in these spaces. It is not just a matter of location or population density; it also involves the unique cultural and community characteristics of these areas, their challenges, and their strengths. This has implications for K-12 educational systems and associated student opportunities and perceptions. Incongruent definitions of rural can result in policy implications [13] and incorrect research conclusions or failures to serve those intended [14].

With each place being unique, each having its own identity that is much richer and more distinct than the various agency definitions of rural, broadening the defining characteristics of rurality can help us better understand the contexts in which teachers work, which greatly influences their needs. Understanding the diversity of these contexts can help us better identify ways of supporting teachers within these contexts. Therefore, in this paper, we approach rural carefully considering "contextual variables that could influence educational experiences in rural settings" [15] (p. 17). We share the perspectives of teachers who work in schools that are situated in areas they define as rural. By capturing teachers' definitions of rurality and their unique experiences with rural, we can better reflect the diversity of these unique contexts.

What Are the Characteristics of Rural Schools?

The scale and location of rural schools vary significantly, ranging from extremely remote areas to locations near large metropolitan areas [16]. Despite this variation, the literature reveals several shared features of rural schools. Rural schools are often characterized by smaller class sizes and tend to have close-knit relationships with their communities [17–19]. Rural schools have relatively smaller organizational scales with a streamlined administrative structure, which not only reduces bureaucracy but also enhances the capacity to address educational challenges creatively, such as by integrating local community resources into the school [18]. Furthermore, rural schools have a unique opportunity to connect their curricula with the local environment, provide authentic learning experiences, and nurture a strong sense of belonging among students [17,20].

Despite these attributes, rural schools face some significant challenges. They are often impacted by demographic changes, including migration, aging populations, and economic shifts. Such changes lead to reduced local property tax revenues, which result in underfunding and a lack of resources in rural schools [21–23]. Recruiting and retaining highly qualified teachers, especially for high-need or specialized subjects like special education or English for Speakers of Other Languages, is another significant challenge [24]. Moreover, there is a lack of effective professional development programs in rural school districts to equip teachers with the necessary skills for these high-need areas [24], and

teachers in rural schools tend to take on multiple roles, such as counselor, coach, and science teacher, compared to teachers working at non-rural schools where they have specific roles [25].

In this paper, we steer away from a deficit approach when discussing rural schools. Instead, we aim to characterize rural schools as institutions possessing distinct and unique features. This perspective allows us to acknowledge the diverse strengths and challenges inherent in the rural education landscape and recognize the "rural cultural wealth" in schools [26]. By emphasizing the uniqueness of each rural school setting, we aim to highlight the potential for tailored educational practices that respect and leverage the individual characteristics of rural schools across the nation [27] and contribute to the understanding of "rural nuance" in educational research and the literature [28].

To capture the teachers' definitions and perspectives of rurality, we proposed the following research questions: (1) What community characteristics do teachers highlight when sharing about their contexts? (2) How do teachers describe the benefits of teaching in their rural community?

2. Materials and Methods

2.1. Participants

Thirty-five participants were selected from a larger, multi-state project examining the longitudinal impacts and sustainability of science and engineering professional learning (PL) tailored to rural educators in grades 3–5. This online PL was curriculum-agnostic and aimed to support teachers in rural settings in resource use and refinement based on local context. While the larger study had over 150 participants, our study focused on a subset of teachers who were selected from each of the four participating states: nine teachers from California, Montana, and Wyoming and eight teachers from North Dakota. Teacher participants were purposefully selected to represent a range of grade bands and included six third-grade teachers, eight fourth-grade teachers, seven fifth-grade teachers, seven teachers who taught multiple grades in separate classes, and seven teachers who taught multiple grades in a combined classroom. These teachers all taught science; however, the context in which they taught varied (e.g., science specialist, teacher of all subjects, teacher of some subjects, teacher with paraprofessional support). As part of the larger project, teachers shared their comfort level with teaching science and engineering; for this study, we also selected teachers with a range of comfort in science and engineering instruction. The participants all self-identified as working in a rural context. Table 1 illustrates the NCES and US Census Bureau designations of the teacher participants' school contexts.

Table 1. Agency-based rural designations of participating teachers.

% of County That Is Rural [1]	School in Rural Area %? [2]	Locale [2]	School District Locale [2]
	California		
>99%	Yes	42	Town, distant (32)
>99%	No; town, remote	33	Town, remote (33)
>98%	Yes	42	Town, distant (32)
>98%	Yes	42	Town, distant (32)
>98%	Yes	42	Rural, fringe (41)
>98%	Yes	41	Rural, fringe (41)
>98%	No; town, distant	32	Town, distant (32)
>95%	Yes	41	Town, fringe (31)
>90%	No; suburban, large	21	Suburban, large (21)
	Montana		
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
>99%	Yes	42	Rural, distant (42)
>99%	No; town, remote	33	Town, remote (33)
>99%	No; town, remote	33	Town, remote (33)

Table 1. *Cont.*

% of County That Is Rural [1]	School in Rural Area %? [2]	Locale [2]	School District Locale [2]
	North Dakota		
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
100%	Yes	43	Rural, remote (43)
>98%	Yes	42	Rural, distant (42)
>98%	Yes	42	Rural, distant (42)
>98%	Yes	41	City, small (13)
	Wyoming		
100%	Yes	43	Rural, remote (43)
100%	No; town, remote	33	Town, remote (33)
>99%	Yes	43	Rural, remote (43)
>99%	Yes	43	Rural, remote (43)
>99%	Yes	43	Rural, fringe (41)
>99%	No; town, remote	33	Town, remote (33)
>99%	No; town, remote	33	Town, remote (33)
>98%	Yes	42	City, small (13)
>98%	Yes	42	City, small (13)

Note: underlined text corresponds to discontinuity in designations between teacher perception and school or district or school and district designations. [1] Data source: US Census Bureau 2020; data source: [2] NCES 2021–2022 EDGE data.

2.2. Data Sources

This paper drew from three data sources: identity slides and community walk slides, which were created by the teachers, and a semi-structured interview administered after a 5-day virtual PL experience.

2.2.1. Rural Community Walk Slides

Grounded in the belief that every rural place is unique, Downey [29] developed the Rural Community Walk (RCW) as an embedded-in-place learning experience for preservice rural teachers in Montana to develop a more nuanced understanding of the rural communities in which they might teach. While the RCW was originally developed to help preservice teachers identify their preconceptions about rural communities and develop a better understanding of those communities, we saw potential for using the RCW with our in-service teacher participants. Primarily, we wanted to see how our rural in-service teachers chose to present their rural communities to others in the project. We modified the RCW task, first asking our teachers to read Chapter 6 of *Teaching in rural places: Thriving in classrooms, schools, and communities* [30]. Then, we asked teachers to draw from the RCW instructions in Chapter 6 to complete their own RCW and share their findings in a single Google Slide that was shared with the whole group. These slides were created by teachers after the 5-day virtual PL experience, and teachers were asked to look at other teachers' slides to see connections between their community and the communities of their colleagues (Figure S2).

2.2.2. Identity Slides

The literature reports that interacting and making a connection with fellow teachers leads to successful online PL (e.g., [31,32]). Prior to the 5-day virtual PL experience, we asked teachers to introduce themselves and their context in one Google Slide that was shared with the whole group. We asked them to post pictures, words, or links to express themselves, their interests, their environment, and things that are important to them. We specifically asked them to include the rural area in which they work, the benefits they saw of teaching in that local context, and their interests (e.g., hobbies, collections). These slides were used during the 5-day PL to help teachers get to know one another and build rapport (Figure S1).

2.2.3. Interviews

To capture teachers' perceptions of teaching engineering and science in rural settings, we employed multiple case studies [33], in which each teacher constituted one case. Teachers were interviewed one-on-one for 45 min via Zoom. Eight senior members of the research team collectively completed these interviews. During the interview, teachers were asked to describe the context in which the school is located (e.g., What town is your school in? Can you share a little about your community, district, and school?), their perceptions around teaching science and engineering (e.g., How would you describe quality science instruction?), their experiences with the 5-day summer professional learning, and their thoughts on future modest supports they would receive (e.g., monthly virtual PLC meetings, newsletters). To answer our two research questions, we focused on the interview responses regarding the description of their context and their role within that context.

2.3. Data Analysis

2.3.1. Rural Community Walk Slides

We took a two-pronged approach to coding the RCW slides, with the first prong applying a holistic coding approach [34] and the second prong utilizing an a priori code book. First, we looked at each RCW slide holistically, applying a descriptive coding process [34] to identify examples that participants chose to share about their communities. We chose to employ a descriptive coding process first to ensure we were fully considering all of the pictures and text the participants included on their slides rather than limiting our search to the predetermined codebook. Next, Chapter 6 of *Teaching in rural places* contains a list of 12 potential things to look for on the community walk: (1) businesses (e.g., general stores, restaurants), (2) organizations (e.g., churches, museums), (3) healthcare (e.g., clinic, dentist), (4) civil service (e.g., police, fire department), (5) economy (e.g., ranching, recreation), (6) education (e.g., schools), (7) cultural engagement (e.g., theaters, art centers), (8) facilities (e.g., buildings, recreation facilities), (9) infrastructure (e.g., roads, biking paths), (10) transportation (e.g., public transportation), (11) community leaders (e.g., politicians, individuals who contribute to community), and (12) community stories (e.g., local history). We used this 12-item list as an a priori codebook, coding the presence or absence of each. Lastly, we looked at the examples of the 12 items that were shared in more detail to determine how the participants chose to represent these items within their communities, combined that with the codes that emerged from the descriptive coding process, and conducted a round of focused coding [34] to identify salient examples emerging from the RCW slides. The community walk slides were individually coded by two researchers, each coding half of the slides. After independently scoring the slides, the two researchers discussed multiple slides in depth to ensure consensus on how they had applied the coding process and then discussed the patterns and salient examples they noticed in their coding.

2.3.2. Identity Slides

Two researchers individually coded the slides using the a priori RCW codebook to identify characteristics that participants chose to share about their local context, as well as identify any emergent themes. In addition, the two researchers applied a descriptive coding process [34] for the benefits of teaching in your local context responses to capture the conception of their role within the rural context as educators. Through discussion, the two researchers derived themes and ensured consensus.

2.3.3. Interviews

Participant interviews were video- and audio-recorded, verbatim-transcribed, and coded using the same two-pronged approach as with the RCW slides, looking for emergent and a priori themes [35,36] through multiple cycles of analysis and discussion to identify teachers' definitions of rurality [34]. In the first cycle of the analysis, four researchers used a descriptive coding process to each independently analyze four interview responses (>10%), after which they discussed and developed codes to analyze the remaining inter-

views. Using this coding structure, the remaining interviews were individually coded by dividing interviews among the four researchers. To establish intercoder agreement, researchers compared themes and memos, discussed similarities and discrepancies, and used conversations to reach consensus for refined codes [37]. Themes regarding teachers' perceptions of rural education were derived [34]. Based on these themes, we selected two cases—Oliver and Casey—as their perceptions capture the themes as well as the unique aspects of rural education.

The entire research team convened to discuss emergent themes and use of the a priori codebook after all individual data source analyses were complete. Collective themes were discussed and identified to create a more holistic representation of participant perception.

2.4. Trustworthiness

Credibility was established through triangulation of multiple data sources as well as multiple researchers [38]. Three sources of data (i.e., community walk slides, identity slides, interview transcripts) were collected and analyzed separately and later merged to identify shared patterns across the different data sources. Multiple researchers were involved in the analysis of each of the data sources and engaged in a consensus building process after initial data analysis (see Section 2.3 Data Analysis for additional detail). To further ensure credibility, researchers kept a detailed audit trail and utilized thick descriptions [39].

Although the authors did not lead the initial professional learning institute for teachers in the summer of 2023, we facilitated the ongoing professional learning communities that teachers participated in throughout the 2023–2024 academic year.

Furthermore, the authors of this paper have deep knowledge and expertise on teaching in rural areas or in contexts similar to the teachers in our sample. Between us, we have a total of 15 years of teaching in rural schools in grades K-8. We have lived in rural areas of the United States including the Intermountain West, Appalachia, Southwest, and Midwest for a cumulative total of approximately 60 years. Across our team, we have been providing professional learning to teachers in rural areas for a total of 20 years. The authors therefore have deep personal experience with and knowledge of living and teaching in rural areas such as the communities these teachers live and teach in. Similar to Santamaría-Cárdaba and Sampedro Gallego's [40] concluding recommendation that teachers should be valued for their potential research contributions that can enrich our understanding of the rural context, we agree with this stance and center teachers in our work to further elucidate the diversity of that which is rural.

3. Results

Across the three data sources, teachers described their rural contexts as being both diverse and connected, but the ways in which they were diverse and connected varied. Interestingly, participants described how the community assets they shared supported their instruction, which was not prompted by the interview protocol or other data sources. We found that although we asked about teaching science and engineering in their context generally, teachers shared the affordances of teaching in a rural context unprompted. Figure 1 depicts a representation of these findings.

In the following sections, we first present findings related to how teachers discussed diversity in their rural contexts, the types of connections they describe with their students, their communities, and their local environment, and how teachers described accessing that diversity and connectedness in their instruction. Finally, we conclude with two case studies further defining the uniqueness within these themes.

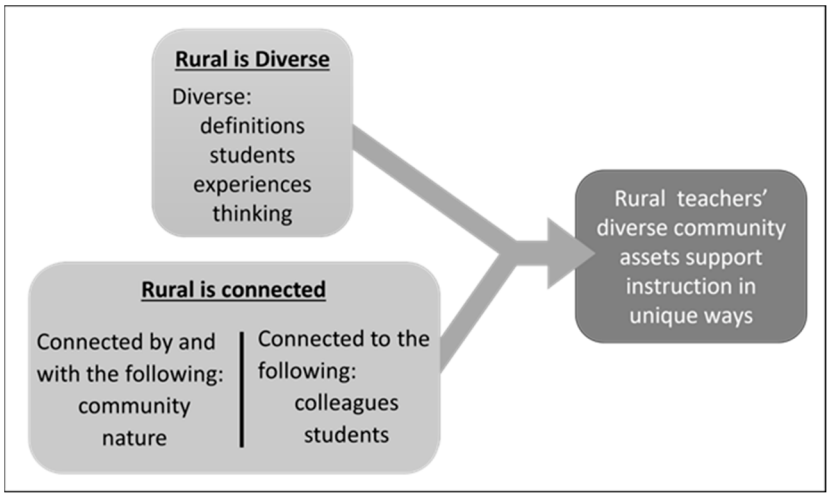


Figure 1. Summary of analysis themes.

3.1. Rural Is Diverse

Across data sources, teachers shared about the diversity of experience in rural contexts that might not typify stereotypical ideas of rurality. Three themes emerged: diverse definitions of rurality, descriptions of diverse students, and diverse experiences teaching in a rural setting.

3.1.1. Diverse Definitions of Rural

As evidenced in Table 1, despite all of the teachers in this study self-identifying as teaching in a rural context, their perceptions do not always align with agency definitions. Seven teacher participants work in places that are not designated as rural by NCES or the US Census Bureau, and nine others work in places that are considered rural but lie within a school district that has a larger designation (all but one of which are not designated as rural). Most discrepant is one teacher who considers herself to be in a rural area who teaches in a location designated as a large suburban area.

Even when rural designations align with teacher perceptions, there are distinctions within the spread. For many of these teachers, the school and district in which it resides are all rurally designated. All of these teachers work in places in which the county itself is over 90% rural. However, three teachers teach in schools that are in rural-designated areas but lie within school districts that are considered small cities. For four of these teachers, their school is the entire district.

Participants described their respective contexts in a myriad of ways, highlighting the uniqueness of their towns, despite all viewing their place as rural. Although seven of the teachers were not in a rural area as defined by governmental classification systems, they provided descriptions about what they thought made their locale rural. Only a few teachers used metrics like population to describe their town, but this was accompanied by expanded definitions that went beyond these simple statistics and included descriptions of nature, climate (e.g., harsh winters), geographic and economic context, school layout and makeup, and local resources like parks, heath services, and fire departments. For example, multiple community walk slides highlighted geological features such as mountains and rivers, as well as associated outdoor recreation such as fishing, hiking, and biking. There were mentions of local and regional landmarks and attractions such as the northern lights and historic and cultural sites important to both settlers and Indigenous communities. Many participants mentioned agriculturally based activities such as farming and ranching as economic drivers for the community and chose to include examples of various businesses such as restaurants, fly shops, gas stations, and grocery stores. In interviews, two teachers from different states shared details about a boom-and-bust economy that had large

implications for the student population: large fluctuations in numbers, transience, and family backgrounds.

We found that while governmental definitions of rural tend to focus on population and distance to major cities, teachers' descriptions of rural included a much more comprehensive description of their context. And those descriptions and context were unique across spaces. Teachers' descriptions show a vast diversity in what rurality is, how members of rural communities talk about their rurality, and how it might be defined.

3.1.2. Diversity of Student Population

There was also diversity described across and among teachers' student populations in terms of ethnicity, socioeconomic status (SES), differing needs, and home life experiences. While some teachers depicted their student population as primarily one ethnicity, one SES group, and/or monolingual, these teachers also identified at least one way in which their students were diverse from one another. Other teachers painted a picture of wider spanning student diversity with regard to these metrics. For example, these diverse rural places may have had students who were described as "socioeconomically but not ethnically diverse", ethnically diverse with "30% Native American, 30% Hispanic, and then about 30% white or other" or "predominantly white and Hispanic", socially diverse with "mostly English Language Learners", with "a lot of foster care", or in "educational background" due to family transience. One teacher from California described their student population as being nearly 100% Latinx. They noted that most of their students' families worked in the local agricultural economy. This teacher said that of their class of 10 students, more than half of those students were not fluent in conversational English. A teacher from Wyoming noted their school's proximity to a reservation which meant that approximately a quarter of their students were Native American. A teacher from North Dakota described the diversity of student academic performance and diversity of thought in their class, saying,

> Even in an individualized classroom, we have so many lower level learners, but then I also have some that are 2 levels above them too. I have to use a lot of vocabulary to keep some kids in it, and then I have to go down to the bare minimum just even in the same sentence. But they're all hearing it in different ways, too. And they're seeing things in different ways.

This teacher described how even in their classrooms with smaller class sizes, there was much diversity amongst the students in regard to their academic level but also how they engage with the content. This meant that they needed to be thoughtful about how they engaged their students in science content based on their diverse assets. About one-quarter of the teachers did not give specifics about their students other than how many students they had when describing their context.

3.1.3. Diverse Teaching Experiences in Rural Settings

In interviews, teachers also described a diversity of teaching experiences and settings in rural settings. Teaching in a rural setting did not look the same across contexts with variance in school infrastructure and aesthetics, class composition, professional freedom, collaboration opportunities, and connections to place. For example, teachers' autonomy to adjust the curriculum varied by location. Several teachers in California noted that they did not have autonomy to change the curriculum, but this was not true for many of the rural teachers in other states like Wyoming and Montana. One teacher from California did note that a smaller district administrative network and a personal connection with a local school principal at another school allowed them some autonomy and an opportunity to have a voice in updating district science curricula.

Some teachers could focus on single grades while others had five students spanning six grades in the same class. Several teachers were from the rural community in which they taught, with at least three having a daughter or mother who also worked in the school district. One shared experience across teacher interviews was adapting to meet varied student needs, wanting to provide better access for *all* students, or considering creative

solutions to provide *all* students meaningful science experiences. Several teachers described ways in which they worked within school scheduling limitations to ensure all students experience place-relevant science instruction, despite some students getting pulled out of their class for academic interventions or other curricular obligations.

While many rural teachers experience isolation, several teachers from both Wyoming and North Dakota discussed how they have access to a team of other teachers with whom to plan. One of these teachers noted that they were not used to having so many teachers to work with and that they were worried "it would be a lot of voices". However, they have been able to collaborate on problem-based lessons for science and engineering in a collaborative manner that is "awesome".

3.2. Rural Is Connected

A second theme that arose from our analysis was connectedness. Teachers described how their rural teaching context compelled and promoted them to cultivate connectedness, whether it was to their community, to students and their families, to their local environment and nature, to a community identity, or to colleagues within their school or district.

In their identity slides, teachers talked about feeling close-knit with their local community as well as their smaller school community. One California teacher said, "The local community is very supportive of our school and tries their best to take care of us". Another teacher from North Dakota said that the size of their school "leaves the door open for more opportunities to build quality relationships with students".

Within their district, one teacher described the professional development offered through the district as a relationship building opportunity and a source of curricular support. This teacher explained how in these sessions, their colleagues shared and worked collaboratively on designing student proficiency scales. They said, "The mentorship program was really good last year, and it feels like everyone has access to stuff which has just been helpful to know that you don't have to reinvent the wheel".

As another example, a California teacher described in their interview that the remoteness of their school site actually supported relationship building with their students. This teacher explained that since the school was so remote, many parents needed to bring their children to school. This created more touch points for teachers to connect with parents and foster meaningful dialogue with the students and their families.

Teachers also described feeling connected through a rural town identity in their interviews and community walk slides. Teachers noted a feeling of pride in their town and the hallmarks that made their town special, such as museums, national parks, and landscapes. Teachers emphasized the local resources and unique contributions of their town with a sense of pride and often self-identified as a rural school teacher, beyond simply being a teacher.

3.3. Community Assets of Diversity and Connectedness Support Instruction

A final theme connects to teachers painting a picture of their schools and larger communities as rich and diverse contexts brimming with local phenomena that can and should be connected to science and engineering instruction. Teachers described taking on the role of accessing local geography, economics, and community assets in their instruction for students; they discussed connecting students to their community and beyond through their classrooms. Teachers offered this description of their role as student and community mediator without being explicitly prompted in interviews; this discussion of assets of their rural contexts was generatively shared, at length in some cases, unprompted.

Teachers emphasized a desire to expose students to the larger community, the local economy, skills for community jobs, and experiences and kids outside of their community. Teachers discussed a desire to connect students to future careers, relevant applications of disciplinary ideas, other students across the state with similar contexts, the outside world, and to their communities' human and natural landscapes. One teacher from Wyoming, for example, described how their community was predominantly a ranching community,

with many engineers and scientists who worked in the local economy. They discussed how they frequently brought in scientists and engineers from the community to talk to students about their work:

> We have a conservation district here and our soil guy came and talked about the differences of soils, what can grow in those soils, and what is inside of those soils. We also had a sheep shearer and we talked about how you have to go from feeding the sheep, to taking the wool off, to actually making the blanket. So then we got a Native American weaver that came in and showed us how to spin the wool.

Teachers discussed how science and engineering is present in farming and ranching traditions, and they used these connections in their instruction to garner student interest or possibly turn that interest into a career.

In all data sources, teachers talked about exposing students to the unique assets of the location in which they live. In the community slides, teachers described their local geography as a benefit and gave examples of drawing on local phenomena like snowfall, drought, floods, and high winds as an opportunity to engage students in learning through contextual experiences.

Teachers also discussed how important science and engineering was for their students, especially for their linguistically diverse students. A teacher from California emphasized that science and engineering were great tools for teaching academic language since her English language learners could manipulate and experiment with their hands while engaging in academic discourse with their teacher and peers. Teachers provided rich descriptions about connecting their science instruction to local phenomena to better serve diverse students.

3.4. Case Study #1: Oliver

Oliver has taught for 11 years in a one-room K-6th-grade schoolhouse, which they refer to as a "tiny, tiny school" situated in a "community [that] is all rural. . .all ranchers or just country living" with an "almost conservative ideology". This year, Oliver has one kindergartner, two first graders, and one third grader. In this instance, Oliver's self-defined "rural" status aligns with many nationally defined designations. As per the US Census Bureau and NCES, this school is located in a distant rural designated location; however, the school district in which Oliver's school is located is considered a small city and the largest district in the state. From Oliver's perspective, the school is "nestled" in an "old mining town" at the "base of a mountain", "where only the school and the volunteer fire department remain". "We have the prairie all out on our playground". Apart from several qualitative descriptors of size and stating the number of students they teach this year, Oliver did not talk about their context via population size. Rather, elevation above sea level was one of the only numerical values shared. This rural setting is a place that provides enjoyment, intrigue, and a strong connection to the community and its way of life for Oliver, with a self-imposed obligation to advocate, expose, and connect students to opportunities within and beyond their community.

3.4.1. Rural Is Diverse

The diversity of this rural space is described by Oliver within the context of its past and its present. What was once a thriving mining town is "now a very small community of ranchers" that experience challenges like flooding, fires, wildlife (mainly rattlesnakes), extreme cold, and unreliable internet. Despite these potential challenges, Oliver views this place as a rich environment for science classroom exploration through things like the weather (albeit extreme), the wildlife (despite their potential danger), its technological assets (even if sometimes unreliable—"I love being a one-room schoolhouse teacher! It reminds me of the past, but with all the access to the future!"), and the opportunities to incorporate and support the rich local culture (even if it sometimes results in the following

situation: "All of our students either miss school because they're moving cows or calving or branding, . . .I have to be flexible, and I love it though").

3.4.2. Rural Is Connected

The rural town in which Oliver works is a place in which the educational system, the economic livelihoods of its community members, and the community itself are tightly connected and intertwined. Funding is small, and administrators are not always present, and yet Oliver has a lot of curricular flexibility and support of the administrators in allowing them flexibility and in supporting them when they reach out to ask for something. They feel "full parent support" and community support. These are highlighted in Oliver's interview through examples of "dragging [someone] here" to help as a robotics coach, the volunteer fire department coming to school to support instruction, and joint staff meetings with their "sister schools" (the multiple rural schools in the district), which create collegial support.

3.4.3. Community Assets of Diversity and Connectedness Support Instruction

For Oliver, this rural setting is much more than its small population size and distance from an urban area. It is a place to be valued and engaged with in authentic ways to support students by "advocating for [their] students to gain access" to diverse experiences and community resources, exposing students to opportunities and people outside the community, and connecting students to their community. And, they have the agency and flexibility to adjust the larger district-determined schedule and curriculum. In the interview, Oliver tells a story that depicts their desire to seek out resources within and outside of the community and advocate for student exposure to these resources:

> I need to be take more initiative to reach out to see what's available in our community because I am out in the middle of nowhere, . . .we had the fire department come out on—the Volunteer Fire Department come out and take, bring out his truck and, but they also brought out a safety trailer that I didn't even know existed, and [the students] didn't realize that existed, . . .So, like, just making sure that I'm finding the resources, . . .and then just advocating for my students to gain access. . . .that's the hard part.

Oliver thinks it is important to expose students to opportunities outside of their community as well. From district and statewide Lego robotics competitions to field trips with other schools and kids their age in the district ("so that the kids have an opportunity to, again, engage with other kids"), they bring as much science and technology as they can to these "kiddos", "just as if they were in town", because "they are sheltered compared to in-town schools. They don't know what is necessarily—know what a museum is unless their parents have actually taken time off from cattle ranching to go to a museum, or things like that, so just exposure to new things".

3.5. Case Study #2: Casey

Casey is a fourth-grade teacher teaching all subjects to over 20 students with nine years of experience in rural schools. They are a self-described teacher leader for science in the district and "point person" for science education at their school site. Unlike Oliver, Casey's perception of their school as "pretty small, it is very rural" is vastly different from agency designations, which denote the school as part of a large suburban area. From Casey's perspective, the school is a "[transitional kindergarten]—8th grade campus" surrounded by "a lot of small family farms" and ranches that "rely on irrigation". The town itself is geographically "split right down the middle with [a] highway". Conversely to Oliver, Casey did include county population and proximity to a nearby city in her RCW slide description. Whereas Oliver spoke in depth about their advocacy for increasing student access, exposure, and community connections, Casey focused more on creating spaces for students to "figure out", engaging students with ideas associated with irrigation and highway presence, and getting students invested in their learning. On a personal level, Casey shared insights into how their own professional growth has supported teaching in

this context. The explicit notions of instruction being supported by diverse and connected rural community assets were less present in Casey's interview than in Oliver's interview.

3.5.1. Rural Is Diverse

Although many participants in California describe a lack of autonomy to make decisions about their instruction, Casey is one of the few Californian participants to describe having a lot of autonomy. For Casey, their administration believes instruction should be teacher-driven since "[they] are feet on the ground, knowing [their] students as well as [they] do". Their district-level administration is also generally open to purchasing science supplies or supporting professional learning opportunities when asked. For Casey, the local community and its "fast growing" infrastructure provide a rich space about which students ask questions. Nearby irrigation and utility concerns are relevant fodder for learning because "agriculture is really important in this area" and "there's a lot of transportation that goes on here". Despite sharing that drought was an issue in their community, Casey depicted their rural community as a lush, green orchard filled with ripe fruit and tall trees in the background.

3.5.2. Rural Is Connected

The rural school itself provides a community of close relationships between colleagues and unique connections with administrators. The rural community's location (near a larger city) allows Casey to connect students with resources and experiences beyond their community.

With those close collegial relationships, Casey notes some pushback from colleagues when offering up new ideas that require "a little bit of legwork" but also mentions a daughter in the district who held a principal role, which allowed them to "kind of buddy team" to update the science curriculum in the district.

Field trips to a large science museum not too far from their town where students would have the opportunity to take part in a lab on electricity and green energy are an opportunity afforded by this rural setting and its proximity to other communities. The community connections and advocacy to support students in relation to their communities was more present across all of Oliver's data sources than with Casey's. Casey shared an example of the close connections they have with parents who call to tell them that their child "will not stop talking about" what they did/learned in science class. They also emphasize the connections made to local issues around engineering instruction and relevancy.

3.5.3. Community Assets of Diversity and Connectedness Support Instruction

For Casey, the geographic context and transportation-associated development projects of this rural place provide authentic, meaningful engagement for students. Drawing on irrigation systems, new transportation proposals, and road access questions, Casey found relevant connections to science and engineering instruction:

> We have a lot of small family farms around here that rely a lot on irrigation. [The electric company] is balancing whether or not to replace a lot of the utility polls, or just bury all the wires. And so I know that some of the kids live along the side where there's canals, and they were wondering would that mean they get more roads in? You know, just things that they would have something to do with every day.

Casey connects to students' own experiences with wildfires to build empathy with others outside of the community: "[Students] journaled in their journal about the [Maui] fire and how we have wildfires near us, and to think somebody out in the ocean on an island could have wildfires". As mentioned above, the geographic proximity to a larger city creates connections to a larger context and set of resources for students. Whether it had to do with field trips or Casey's own professional growth, they spoke to the idea of also going outside of their rural space to bring back ideas, knowledge, or skills to their community.

4. Discussion

To capture the teachers' definitions and perspectives of rurality, we sought insights into the following research questions: (1) What community characteristics do teachers highlight when sharing about their contexts? (2) How do teachers describe the benefits of teaching in their rural community?

Based on our findings, teachers highlight their contexts as diverse and connected with variation among that diversity and connectedness. Diversity was shown within their definition of rural (e.g., geography, climate, proximity, environmental and manmade features, economy, local resources), in who their students were (e.g., ethnicity, SES, homelife, learning needs), in teaching experiences and settings (e.g., school infrastructure, class composition, professional freedom, collaboration, personal connections), and in rural community members' worldviews (e.g., politically, religiously). This is in contrast to the narrow numerically driven definitions of many governmental agencies.

They describe the benefits of teaching in their rural communities as places that compelled and promoted the cultivation of connectivity by and through the community, its surrounding nature, and its identity, as well as connectivity through relationships with colleagues, students, and/or families. These connections were often accompanied by feelings of pride in their rural place. A theme that emerged in the data that was unprompted by any data source was the notion that teachers viewed their diverse community assets as rich, productive, and authentic means of supporting their instruction. Teachers emphasized a desire to help students discover these unique assets of their rural communities.

A rural school is the heart of that community [41] as it shapes the local identity, creates a source of pride, and supports much more than just a formal K-12 educational setting [42]. Our approach to exploring the meaning of "rural" carefully considered the contextual variables influencing these settings through the perspectives of thirty-five teachers within those schools, so as to begin to elucidate the unique diversity present across rural areas in California, Wyoming, Montana, and North Dakota and to amplify a case for reconsidering current definitions driven by population and urban proximity. Teachers' descriptions of their rural communities were characterized by contextual factors that went much deeper than these two characteristics. Defining rural within the context of population and urbanity disregards the assets that these communities bring and reinforces a perspective of homogeneity. Additionally, rurality is often described through a deficit model, but our research shows the great number of benefits and asset-based interpretations of challenges associated with rural spaces, highlighting the more holistic "rural cultural wealth" that these places hold [26].

Our research findings and the voices of these teachers parallel studies showing more flexibility and fewer disciplinary issues (e.g., [43]), more autonomy in instruction and use of curricular resources (e.g., [44,45]), and strong teacher–community engagement (e.g., [46]). They also align with research suggesting positive attributes such as smaller class sizes, close student relationships, and deeper community connections [44,47]. However, these trends were not true of all participating teachers, which highlights the potential limitations of these generalized trends and the uniqueness of rural spaces. For example, even though most teachers felt they had autonomy, several rural teachers did not have the autonomy to make curricular adjustments. Even though some studies have found that rural communities tend to participate in educational events more than urban families (e.g., [48]), we found both strong family and community involvement and more constrained involvement due to, at least in part, career and livelihood demands.

Counter to the prior literature showing that teachers leave rural areas because of a lack of connectedness (e.g., [49]), the majority of the teachers in our study, which represents educators across multiple grades in four states, mentioned connectedness as important to and as a benefit of their teaching context. These connections took the form of connection to community, connection to place, connection to colleagues, and connection to students and their families. These findings along with the notion that rural schools play an important role in providing social cohesion (e.g., [40]) suggest more research is needed to further

explore the social relations and connectivity present in rural areas and what role they play in these communities.

The voice of the practitioner is paramount in reconsidering what is rural, how it is defined, and how that definition impacts funding, access, and perception. Childs and colleagues [50] argue that researchers and governmental offices should consider culture when defining rural spaces; we concur given the results of this study. For some of these rural spaces, the pulse of the community lies with the schools—the facilities provide social and cultural centers (e.g., [51]) and the loss of that school can result in population decline and social fragmentation, which leads to decreased local identity, belonging, and social capital (e.g., [52]).

Schools across rurally designated areas embody diverse geographic and socio-cultural contexts, each with unique characteristics that impact teacher instruction and student learning. Across our sample population, seven teachers self-identified as teaching in rural settings, even though their school did not fit agency definitions of rural. When current agency definitions classify schools in a way that is misaligned with how that community identifies, we might fail to reach these people and communities with appropriate support. If we are to understand the crucial role that our places play in educating our youth, we need to better understand the diversity of what it means to be rural. Only then can we begin to understand the ways in which context shapes experience and use that to inform how we support rural education experiences for both teachers and students.

5. Conclusions and Limitation

From examining thirty-five rural teachers' perspectives, we have found that rural communities are not homogenous entities simply defined by geographic and demographic features but rather vibrant, diverse, and connected places. While rurality is often defined by few parameters, such as population and distance to nearby urban areas, teachers in our study portrayed rural as unique places deeply embedded in local culture (e.g., economic context, school layout) and environment (e.g., nature, climate, local infrastructure), which support teachers to teach their instruction in unique ways. One limitation of this study is that there were only four states included in this study, and these states are all from a single country. However, across these four states, we were able to capture a considerable variation and uniqueness in rural contexts that contributes to the noted dearth of studies [53] looking at, for example, the relationships of schools, families, and other social processes in the rural context. However, more research can be conducted including a wider range of rural settings in other states and how these themes compare across rural settings in other countries, which might help capture a wider range of diversity in rurality.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/educsci14060645/s1, Figure S1: Identity slide directions; Figure S2: Community walk slide directions.

Author Contributions: Conceptualization, M.I., R.H., A.I., M.J.L., M.M. and T.B.; methodology, M.I., R.H., M.J.L., T.B. and M.M.; validation, M.I. and A.I.; formal analysis, M.I., R.H., A.I., M.J.L., T.B. and M.M.; investigation, M.I., M.J.L., T.B., M.M., R.H. and A.I.; data curation, M.M. and N.J.; writing—original draft preparation, M.I., R.H., M.J.L., T.B. and M.M.; writing—review and editing, M.I., R.H., A.I., T.B., M.M. and N.J.; visualization, M.I.; supervision, M.I. and A.I.; project administration, M.I. and A.I.; funding acquisition, M.I., R.H. and A.I. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the National Science Foundation, Discover Research K-12 grant number 2201249.

Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board (or Ethics Committee) of University or North Dakota (IRB0005330).

Informed Consent Statement: Informed consent was obtained from all subjects involved in this study.

Data Availability Statement: Data are unavailable due to privacy reasons.

Acknowledgments: We would like to acknowledge the other members of our research group who have supported funding, project administration, PL facilitation, and research endeavors across the larger project. These individuals include Ryan Summers, Julie Robinson, and Cathy Ringstaff, and Maria Zaman.

Conflicts of Interest: The authors declare no conflicts of interest. The funders had no role in the design of this study; in the collection, analyses, or interpretation of data; in the writing of this manuscript; or in the decision to publish the results.

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