



AP[®] Research Academic Paper

Sample Student Responses and Scoring Commentary

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AP® Research Academic Paper 2023 Scoring Guidelines

The Response...				
Score of 1 Report on Existing Knowledge	Score of 2 Report on Existing Knowledge with Simplistic Use of a Research Method	Score of 3 Ineffectual Argument for a New Understanding	Score of 4 Well-Supported, Articulate Argument Conveying a New Understanding	Score of 5 Rich Analysis of a New Understanding Addressing a Gap in the Research Base
Presents an overly broad topic of inquiry.	Presents a topic of inquiry with narrowing scope or focus, that is NOT carried through either in the method or in the overall line of reasoning.	Carries the focus or scope of a topic of inquiry through the method AND overall line of reasoning, even though the focus or scope might still be narrowing.	Focuses a topic of inquiry with clear and narrow parameters, which are addressed through the method and the conclusion.	Focuses a topic of inquiry with clear and narrow parameters, which are addressed through the method and the conclusion.
Situates a topic of inquiry within a single perspective derived from scholarly works OR through a variety of perspectives derived from mostly non-scholarly works.	Situates a topic of inquiry within a single perspective derived from scholarly works OR through a variety of perspectives derived from mostly non-scholarly works.	Situates a topic of inquiry within relevant scholarly works of varying perspectives, although connections to some works may be unclear.	Explicitly connects a topic of inquiry to relevant scholarly works of varying perspectives AND logically explains how the topic of inquiry addresses a gap.	Explicitly connects a topic of inquiry to relevant scholarly works of varying perspectives AND logically explains how the topic of inquiry addresses a gap.
Describes a search and report process.	Describes a nonreplicable research method OR provides an oversimplified description of a method, with questionable alignment to the purpose of the inquiry.	Describes a reasonably replicable research method, with questionable alignment to the purpose of the inquiry.	Logically defends the alignment of a detailed, replicable research method to the purpose of the inquiry.	Logically defends the alignment of a detailed, replicable research method to the purpose of the inquiry.
Summarizes or reports existing knowledge in the field of understanding pertaining to the topic of inquiry.	Summarizes or reports existing knowledge in the field of understanding pertaining to the topic of inquiry.	Conveys a new understanding or conclusion, with an underdeveloped line of reasoning OR insufficient evidence.	Supports a new understanding or conclusion through a logically organized line of reasoning AND sufficient evidence. The limitations and/or implications, if present, of the new understanding or conclusion are oversimplified.	Justifies a new understanding or conclusion through a logical progression of inquiry choices, sufficient evidence, explanation of the limitations of the conclusion, and an explanation of the implications to the community of practice.
Generally communicates the student's ideas, although errors in grammar, discipline-specific style, and organization distract or confuse the reader.	Generally communicates the student's ideas, although errors in grammar, discipline-specific style, and organization distract or confuse the reader.	Competently communicates the student's ideas, although there may be some errors in grammar, discipline-specific style, and organization.	Competently communicates the student's ideas, although there may be some errors in grammar, discipline-specific style, and organization.	Enhances the communication of the student's ideas through organization, use of design elements, conventions of grammar, style, mechanics, and word precision, with few to no errors.
Cites AND/OR attributes sources (in bibliography/ works cited and/or in-text), with multiple errors and/or an inconsistent use of a discipline-specific style.	Cites AND/OR attributes sources (in bibliography/ works cited and/or in-text), with multiple errors and/or an inconsistent use of a discipline-specific style.	Cites AND attributes sources, using a discipline-specific style (in both bibliography/works cited AND in-text), with few errors or inconsistencies.	Cites AND attributes sources, with a consistent use of an appropriate discipline-specific style (in both bibliography/works cited AND in-text), with few to no errors.	Cites AND attributes sources, with a consistent use of an appropriate discipline-specific style (in both bibliography/works cited AND in-text), with few to no errors.

Academic Paper

Overview

This performance task was intended to assess students' ability to conduct scholarly and responsible research and articulate an evidence-based argument that clearly communicates the conclusion, solution, or answer to their stated research question. More specifically, this performance task was intended to assess students' ability to:

- Generate a focused research question that is situated within or connected to a larger scholarly context or community;
- Explore relationships between and among multiple works representing multiple perspectives within the scholarly literature related to the topic of inquiry;
- Articulate what approach, method, or process they have chosen to use to address their research question, why they have chosen that approach to answering their question, and how they employed it;
- Develop and present their own argument, conclusion, or new understanding while acknowledging its limitations and discussing implications;
- Support their conclusion through the compilation, use, and synthesis of relevant and significant evidence generated by their research;
- Use organizational and design elements to effectively convey the paper's message;
- Consistently and accurately cite, attribute, and integrate the knowledge and work of others, while distinguishing between the student's voice and that of others;
- Generate a paper in which word choice and syntax enhance communication by adhering to established conventions of grammar, usage, and mechanics.

Neighbourhood Design and Community: The Effect of Residential Street Type on Sense of
Community in Southern Ontario High School Students

Word Count: 4213

Introduction

The Industrial Revolution in the 19th and 20th century fueled the formation and growth of dense, gridded cities, a result of rapid urbanization around the world (Britannica, 2022). A gridded street design “has an internally consistent orientation, is relatively straight, and comprises [of] mostly 4-way interactions” (Boeing, 2022, p. 125). Because of the need for city expansion due to the Industrial Revolution, the needs of residents were not a priority in industrial development patterns, and Farahani (2016) explains that consequently, many individuals in the United States experienced “community [loss]” (p. 359) in the late nineteenth century. During this time, Canada also experienced industrialization, and because of its similarity geography with the United States, it is reasonable to infer that a similar situation of street design occurred (The Canadian Encyclopedia, 2006).

In the 20th century, city planning shifted from dense, gridded street designs to more disconnected streets in order to reduce the noise and pollution of cars (Flink, 1990). Boeing’s (2022) analysis of the changes in common street networks in the United States support Flink’s findings. Between the 1940s to 1990s, “griddedness, orientation order, straightness, 4-way intersections, and intersection density declined while dead-end [streets]” (Boeing, 2022, p. 123) increased; however, “since 2000, these trends have...shift[ed] back towards historical design patterns [of gridded streets]” (Boeing, 2022, p. 123).

Trends in urban planning have changed along with the needs of the community, and continuous research is needed to inform new improvements. Despite the clear importance of good urban planning, there has been limited scholarly research conducted on the effects that residential street design has on high school students within southern Ontario. Residential street design is an aspect of urban planning that affects the daily lives of residents; therefore, it is

important to investigate whether a high school student's sense of community relates to the design of their residential street.

Literature Review

To explore the impact that residential street type has on sense of community in high school students, one must first understand the current research established in the two separate topics of sense of community and neighbourhood design. This literature review will focus on the importance of the creation of sense of community, and the elements that make-up a residential neighbourhood, specifically looking at residential street types and the population of children.

Sense of Community

Definition

Types of community can be categorized into three main groups: place, interests, and identity (Farahani, 2016, p. 358). Members of a group share something in common with each other, as explained by Farahani (2016), but being part of a group is different from feeling a sense of community with the group as it is a concept that depends on individual experience. Several scholars have proposed definitions for this term, and McMillan & Chavis' (1989) definition is one that is widely accepted. In this paper, the term "sense of community" will be referred to as the following: "a feeling that members have of belonging...that members matter...and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis, 1989, p. 9).

Multiple studies have supported the contact hypothesis which suggests that an increased number of interactions will result in a closer community (Festinger, 1950; Lu et al., 2022); however, there are also studies that have shown equal levels of sense of community between people with frequent and minimal interactions (Rosenblatt et al., 2009, p. 138). A plausible

explanation for this contradiction is the differentiation between “sociability” and “socioemotional support”, which was defined in a foundational text on the benefit of neighbours written by Unger & Wandersman in 1985 (p. 142). Sociability refers to casual interactions between neighbours, while socioemotional support refers to deeper relationships as a result of more effort placed into acquaintanceships (Unger & Wandersman, 1985, p. 142); the presence of the latter interaction has shown to have a positive correlation with the cohesion of a community (Cook, 1970; Unger & Wandersman, 1985, p. 142). For these reasons, the terms “sense of community” and “social interactions” are related, but cannot be used as interchangeable terms.

Benefits

Quality social interactions are linked to higher community engagement, and increased mental and physical health (Hassen & Kaufman, 2016; Leyden, 2003). The research of Renalds et al. (2010) revealed neighbourhood designs that supported physical activity and pedestrian movement had numerous benefits including more social interactions, lower cases of overweight and obesity, lower rates of depression, and less alcohol abuse (p. 76). Researching youth specifically, Cradock et al. (2009) found that neighbourhoods with low levels of social cohesions and interactions are likely to have more youth that are not physically active and do not participate in available programming of amenities (p. 433). Sense of community has profound benefits on individuals in a community, and must be considered in the context of residential neighbourhoods as well.

Residential Neighbourhoods

Design Elements

Residential neighbourhoods are a complex idea that include many elements of design and planning. Generally, a neighbourhood can be established and differentiated by physical

boundaries or social networks (Holland et al., 2010, p. 691). Built environment is a common term used by urban planners to explain the physical design of a neighbourhood, which includes the availability and quality of “human-made space[s] where people live, work, play and commute” (Hassen & Kaufman, 2016, p. 120). Streets are an important aspect of the built environment because they serve as the “lifeblood” (National Association of City Transportation Officials (NACTO), 2013, p. 1) of communities by “provid[ing] a safe place for people to get around” (NACTO, 2013, p. 1).

Early research findings of neighbourhoods after the Industrial Revolution show that the role of physical neighbourhood communities is changing in modern contexts, and many individuals develop relationships outside of their local neighbourhoods (Durkeim, 1964 as cited in McMillan & Chavis, 1986; Unger & Wandersman, 1985, p. 140). It is plausible that face-to-face local interactions are no longer the determining factor to measure sense of community, but rather, new and innovative ways must be found to adapt to changing communities (Rosenblatt et al., 2009, p. 138). Hochschild (2013) interprets the extent of this phenomenon in children, illustrating that “[f]or many children,...social relationships [can be] mediated through electronic filters such as text-messaging...and Facebook” (p. 230).

Street Types

In the existing body of research conducted on street types, it is clear that there are two main categories that a street can fall under: “through street” or “dead-end street” (Bajunid et al., 2012; Hochschild, 2013; Hochschild, 2015). Streets are considered through streets when both ends of the street can be entered and exited by a vehicle, and their shape can be linear or curvilinear (Hochschild, 2015). Dead-end streets are when only one end of the street can be entered and exited by a vehicle, and the other end has no vehicle entrance or exit (Hochschild,

2015); they can be classified into bulb-shaped cul-de-sacs when the end with no entrance or exit is a circular turn-around space (Hochschild, 2015). The benefits of cul-de-sac streets specifically have been explored by various researchers. Hochschild (2015) concludes that “residents on dead-end streets [with no bulb-end] were not as socially cohesive as residents on bulb streets,” (p. 5) but they are still “more cohesive than residents on through streets” (p. 5). Considering beyond the social benefits of cul-de-sac streets and discussing the tangible advantages, there has been a trend for many years that houses on cul-de-sac streets have a higher house value than their counterparts on through streets (Asabere, 1990, p. 191).

Children & Youth

Hochschild (2013) claims that “[c]hildren are the lifeblood of neighbourhoods - they make streets vibrant, are topics of conversation, transmit information between families, and create reasons for neighborhood gatherings” (p. 241) which is why “[w]hen neighborhood design hinders children’s play, it also hinders community interconnectedness” (p. 241). The opportunity to play is an important part of child development, which is why the extra space that bulb cul-de-sac streets provide is crucial to providing more play space for children (Hochschild, 2013, p. 230). Young children spend a lot of time in the neighbourhood they live in, which is why it is inevitable that their housing situation will influence their psychological, social, and physical growth (Coley & Leventhal, 2013, p. 1775; Hochschild, 2013, p. 230). A study by Haynie et al. (2006) furthers this hypothesis to include older adolescents as well. Since a youth’s housing situation impacts their schooling and peer networks, it is assumed that it will, in turn, influence their overall wellbeing as well (Haynie et al., 2006). Brown & Larson (2009) contradicts this belief and suggests that for older adolescents, they tend to spend more time outside of their family home and in their greater community, which implies that place of residence does not have

a large impact on childhood development beyond early years. On the other hand, Hochschild (2013) points out that in “urban, suburban, and rural contexts, children venture outside their homes for various forms of individual and group recreation,” but their local neighbourhood is still their home and influences their development (p. 229).

Summary

A review of the literature illustrates that there is a relationship between the physical design of a neighbourhood and a resident’s sense of community and social engagement. Study findings have shown that the physical design of a neighbourhood can develop social interaction between neighbours (Cao & Wang, 2016; Lu et al., 2022). In turn, “good suburban streetscape design [may] better connect residents to their environment and neighbours and thus proved the sense of community [of residents] by enhancing their social connections (Abass & Tucker, 2021, p. 222); however, as previously mentioned, it is contested whether the amount of interactions and level of sense of community are directly correlated, so this study focuses specifically on the sense of community in high school aged youth. Housing is an extensively researched field, but there is a gap in research about adolescents. Hence, this study bridges the gap in research by exploring the research question: *What is the effect of residential street type on the sense of community of southern Ontario high school students?*

Method

To answer my research question, I chose to conduct a mixed methods survey with a cross-sectional design dominated by quantitative data. Quantitative data is used when the variables are known (Leedy & Ormrod, 2013, p. 96), which is why it is the chosen method to collect information on the type of residential street because there are common types of streets. Participants ranked how much they agree or disagree with statements about community on a

Likert scale. This is a modified version of the Sense of Community Index developed by McMillan & Chavis (1986) to measure sense of community. The meaning of each number on the Likert scale varied by question, so a description of what each number represented was included for each Likert scale question (see Figure 6). Qualitative data supported information from the quantitative questions.

Research Instruments and Sample

A survey was chosen because it can be distributed to a large population and results can be returned immediately. As well, it can collect both quantitative and qualitative data to make generalizations about a population via studying a sample of that population (Creswell, 2014, p. 41). I collected my data using Google Forms, an online platform to conduct surveys. Google Forms is a practical resource to collect needed data because it is easily accessible to me and my study population, who should be familiar with the use of Google apps. In addition to not collecting any identifying information such as names on the survey, there is an option on Google Forms to not collect email addresses which will ensure anonymity of the survey respondents.

My sample consists of high school students in southern Ontario. This sample group was chosen because of feasibility of access, and it is a desirable population to study because Civics and Geography courses are mandatory in the Ontario curriculum, so respondents should have a basic understanding of street types.

Procedure

After IRB approval, I wrote an email to my school administrator to share a link to my survey with all the Grade 9-12 students at my school located in southern Ontario. The survey remained open for three weeks, and a checkbox in the survey confirmed informed consent and that youth under 18 had their parent or guardian's permission to complete the survey. Further, to

prevent participants from being uncomfortable, the survey was anonymous and could be closed anytime.

Study Design

My survey included questions about their demographics, neighbourhood, and sense of community. The first section of my survey asked respondents to confirm their grade and if they currently live in southern Ontario to eliminate responses outside of the study population.

Next, respondents were asked to describe their residential neighbourhood. There are commonly known aspects of street design, which is why questions with multiple-choice answers were the chosen method to collect information about the type of street the respondent lives on. The list of dwelling types that respondents could choose from included “single-detached house,” “semi-detached house,” “townhouse,” “apartment building,” and “other.” This list was informed by studies conducted in the review of the literature; however, it is not exhaustive and the terms may have been misunderstood, which is why an “other” option was included, but this remains to be a limitation of the survey. Other information about their street was also collected, including how busy it is and how long the participant has lived there; however, there are many other unknown factors that may have influenced the data, such as whether participants attend school in their residential neighbourhood, which is another limitation of the study. Respondents then had an opportunity to describe their neighbourhood with a free-response question.

Lastly, participants ranked their levels of community engagement and sense of community with their neighbours. As discussed in the literature review, these two terms cannot be used interchangeably, which is why questions about each were deliberately separated into two separate sections in the survey. Questions about neighbourhood interactions included noting how often respondents greet neighbours and ranking their interaction from positive to negative on a

Likert Scale. Respondents were asked to rank their sense of community as well as whether they feel valued and welcomed by their neighbours or not. Again, the participants had the space to describe the interactions they have with their neighbours and provide reasoning for their respective sense of community ranking. All the qualitative responses were then coded into themes to reveal ideas about sense of community and street type that may not have been considered in the creation of the survey (Tobacco Control Evaluation Center, n.d., p. 2).

Hypotheses and Assumptions

H1. Respondents living on dead-end streets will have a higher sense of community ranking compared to those living on through streets. As understood in the literature review, many studies have shown that dead-end streets enhance the cohesion of a community. I assume that this will also apply to high school students and those that live on dead-end streets will report higher scores to questions regarding sense of community.

H2. Respondents who talk to their neighbours beyond a greeting and have developed positive relationships will have a higher sense of community. There is substantial academic literature demonstrating a positive connection between social interactions and sense of community. While there are studies that have shown it is not always the case, I assume that positive social interactions will result in a higher sense of community ranking.

Results

17 respondents in total completed the survey. 4 respondents left at least one qualitative answer blank. While analysis for every survey question is not included, all questions informed me about their neighbourhoods and sense of community, and only key points are highlighted. There was roughly equal representation from all grade levels, as shown in Figure 1.

Figure 1

Grade distribution

1. What grade are you in?

17 responses

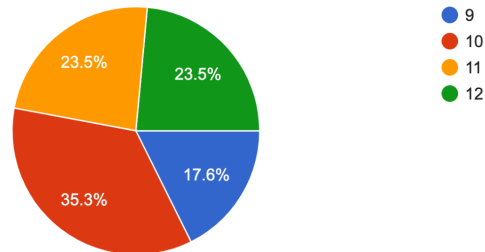


Figure 2 shows that the majority of respondents live on through streets. This resulted in over-representation of this group since this study aims to compare the experiences of students living on through streets and dead-end streets.

Figure 2

Residential street-type distribution

4. What type of street do you live on?

17 responses

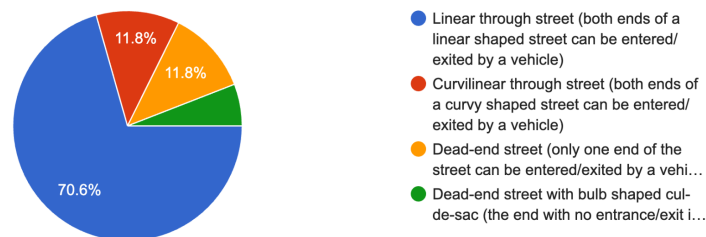


Table 1 highlights the three main themes of interactions that respondents reported to have with their neighbours in Q16. This information explains respondents' reasoning behind choices for quantitative Q10-15 about neighbourly interactions.

Table 1*Qualitative descriptions of kinds and frequency of interactions with neighbours*

Theme	Frequency (15 responses)	Examples
Simple greetings	7 =46.67%	<p>“When I see [my neighbours] on the street I always say hello”</p> <p>“Just simple “hellos” passing in the hallways or comments on the weather”</p> <p>“with my neighbours beside my house, we say hi whenever we see each other”</p>
Helping out neighbours	4 =26.67%	<p>“I teach piano and babysit my neighbours”</p> <p>“often sharing books, tools, and ideas.”</p> <p>“we'll pet sit [for neighbours]”</p> <p>“when my mom bakes we give some to our neighbour”</p>
Fostering deeper connections	4 =26.67%	<p>“book club with the neighbours, and often has [sic] evening gatherings with them. As well, there is a neighbors group chat”</p> <p>“We have meals together, go out on walks”</p> <p>“We are always making plans and we frequently spend days on our porches, laughing [and] talking”</p>

A comparison of Figures 3 and 4 shows that most people will greet their neighbours regularly, but anything beyond a greeting is less common. 64.7% of respondents greet their

neighbours daily or weekly, but only 29.4% talk to neighbours beyond a greeting daily or weekly.

Figure 3

Simple neighbourhood interactions

12. How often do you greet your neighbours?
17 responses

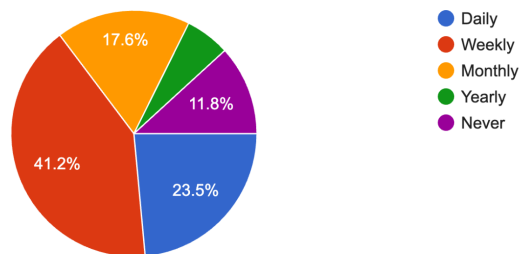
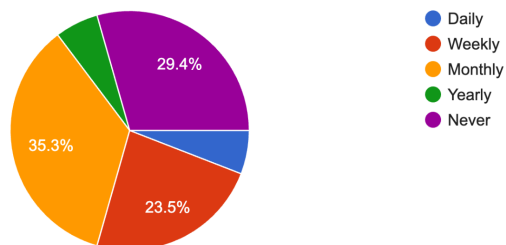


Figure 4

Extended neighbourhood interactions

13. How often do you talk to your neighbours beyond a greeting (ex. Lending tools, Having a meal)?
17 responses



The bar graph illustrated in Figure 5 indicates that all respondents have either neutral or positive interactions with neighbours, and none report prevalent negative interactions. This data aligns with Figure 3 and 4, which shows that respondents have more simple interactions

compared to deeper conversations, because greeting a neighbour can be viewed as neutral or friendly.

Figure 5

Quality of interactions with neighbours

14. Do you have more positive or negative interactions with your neighbours? (1 = more negative, 2 = neutral, 3 = more positive)

17 responses

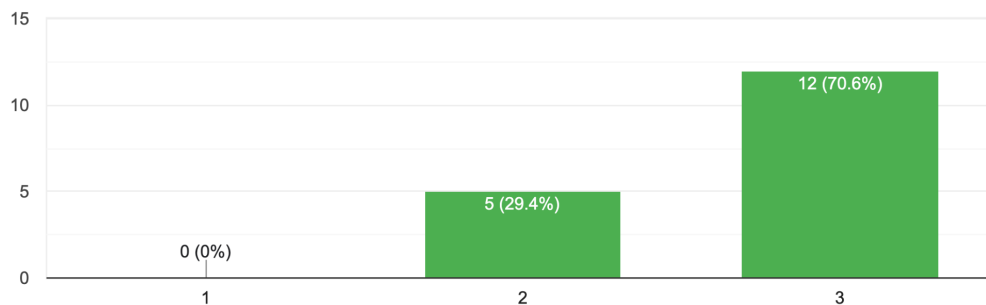


Table 2 shows the main ways that respondents used to explain their sense of community ranking in Q21. This information explains respondents' reasoning behind choices for quantitative Q17-20 about sense of community.

Table 2

Qualitative descriptions of sense of community

Theme	Frequency (13 responses)	Examples
Shallow interactions	6 =46.15%	<p>“we sometimes say hello but the interactions don't usually go beyond that”</p> <p>“most people don't stay that long, so it's hard to really form a connection”</p> <p>“We're not friends, we just live near each other”</p>
Similarities with neighbours and fitting in	3 =23.07%	<p>“everyone is way older or younger than me so I don't really</p>

		<p>fit in.”</p> <p>“They don't make me feel like I don't belong in my community”</p> <p>“young children are pretty much the same age, so everybody has something in common”</p>
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It is clear from Figure 6 that respondents tend to have a higher sense of community since the bar graph is skewed left; however, respondents are mostly neutral on how important sense of community is. Figure 7 is a symmetrical bar graph, so most respondents think that having a sense of community with their neighbours is only somewhat or fairly important.

Figure 6

Sense of community ranking

17. Rank your sense of community with your neighbours. (1 = no sense of community, 2 = low sense of community, 3 = fair sense of community, 4 = high sense of community)

17 responses

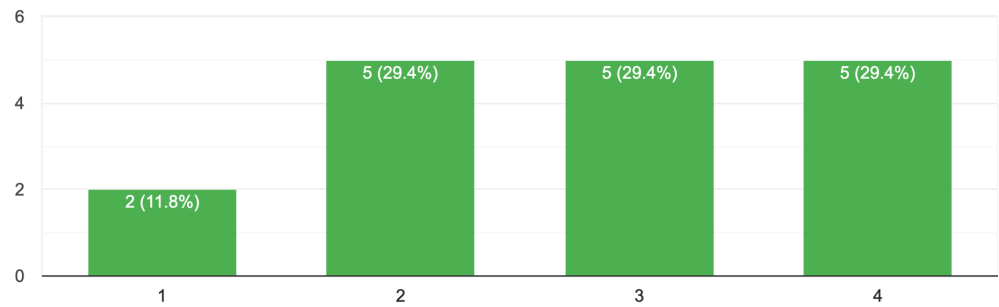
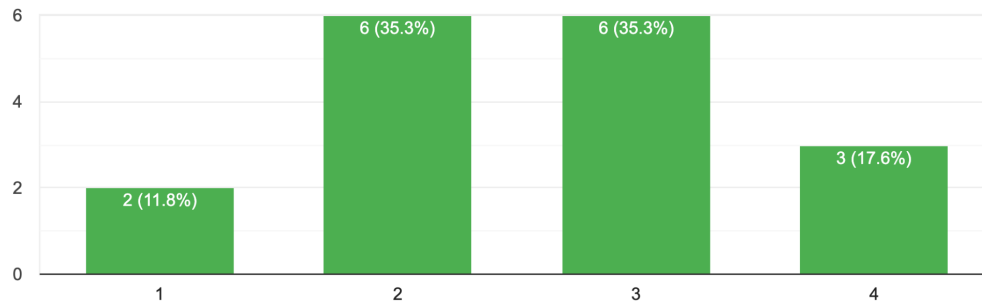


Figure 7

Importance of sense of community

18. Is it important to you to feel a sense of community with your neighbours? (1 = not important, 2 = somewhat important, 3 = fairly important, 4 = very important)

17 responses



While Figure 8 shows that most respondents feel that they belong in their neighbourhood, the majority (64.7%) of respondents don't or only somewhat feel that their neighbours know and value them, as indicated in Figure 9. This means that one's feeling of belonging in a neighbourhood does not solely depend on their relationships with neighbours and how well they think their neighbours know and value them.

Figure 8

Feeling of belonging with neighbours

20. Do you feel that you belong in your neighbourhood? (1 = no, 2 = somewhat, 3 = fairly, 4 = yes)

17 responses

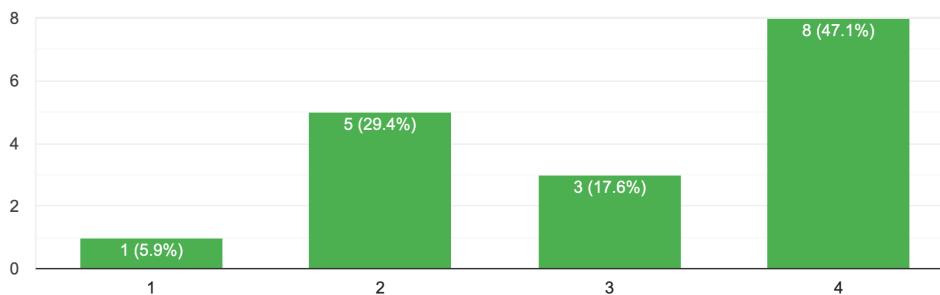


Figure 9

Feeling that neighbours know and value you

19. Do you feel that your neighbours know and value you? (1 = no, 2 = somewhat, 3 = fairly, 4 = yes)

17 responses

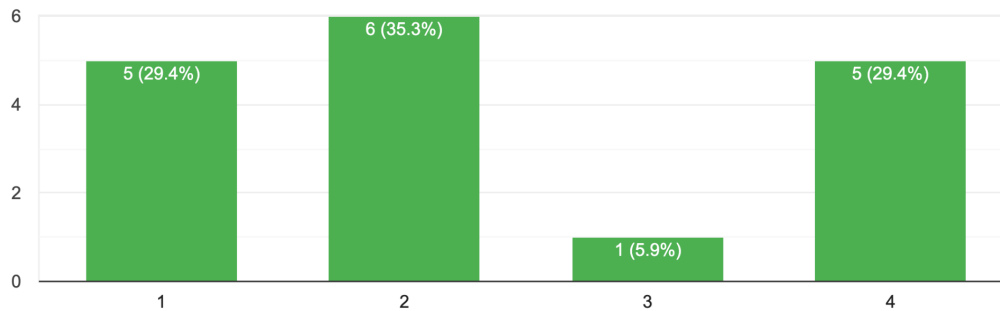


Table 3 represents the themes and connections can be extrapolated by the survey results.

Table 3

Thematic connection of survey results

Thematic Connection	Summary of Finding	Example Responses
Neighbourly interactions and sense of community	The more often respondents talk to their neighbours beyond a greeting, the higher their sense of community.	<ol style="list-style-type: none"> 100% of respondents who reported to talk to their neighbours beyond a greeting daily or weekly in Q13 also reported a fair or high sense of community in Q17. For respondents who never talk to their neighbours beyond a greeting or only talk to them once a year, only 16.7% of them reported a fair or high sense of community
Neighbourly interactions and street type	Respondents living on dead-end streets greet their neighbours more often than those who live on through streets.	<ol style="list-style-type: none"> 66.67% of respondents who answered “dead-end street” or “dead-end street with bulb shaped cul-de-sac” in Q4 reported to greet

		<p>their neighbours daily.</p> <p>2. Only 14.28% of respondents who answered “linear through street” or “curvilinear through street” in Q4 reported to greet their neighbours daily.</p>
Street type and sense of community	A larger percentage of respondents living on dead-end streets reported a higher sense of community than those living on through streets.	<p>1. 57.14% of respondents who answered “linear through street” or “curvilinear through street” in Q4 reported “fair” or “high” sense of community in Q17.</p> <p>2. 66.67% of respondents who answered “dead-end street” or “dead-end street with bulb shaped cul-de-sac” in Q4 reported “fair” or “high” sense of community in Q17.</p>
Sense of community and perception of influence of street type	Respondents who ranked a fair or high sense of community were more likely to feel that their street type influenced their interactions with neighbours and sense of community.	<p>1. Participants #17 ranked their sense of community in Q17 to be “high” and responded “yes” to Q22</p>

Discussion

The results and analysis of the survey responses indicate that my *H1* was somewhat correct, and *H2* was correct.

My first hypothesis predicted that respondents living on dead-end streets will have a higher sense of community ranking compared to those living on through streets. This hypothesis

was partially correct. Of the 3 respondents who live on dead-end streets, 33.33% report to know most or all their neighbours. This percentage is actually lower than the people living on through streets, of which 57.14% out of 14 reported to know most or all of their neighbours. However, for the sense of community rankings, 57.14% of people living on through streets rated their sense of community to be fair or high, while 66.67% of people living on dead-end streets reported fair or high sense of community. While more people on through streets know more of their neighbours, more people on dead-end streets rank a fair or high sense of community. In response to Q22, which asks respondents about whether they think their street type influences their interactions and sense of community with their neighbours, 57.14% of responses felt that there was no influence while 35.71% felt that there was a connection. Many respondents responded that they think this influence can depend on the people living on the street. Some respondents acknowledge that detached houses create little interaction by design compared to townhouses where one issue affects others. Building type is a factor that is not controlled in this study, and could have affected the results and ranking of the respondents' social interaction and sense of community. Nonetheless, this study somewhat showed that respondents living on dead-end streets have closer communities. People on dead-end streets report to know less of their neighbours compared to people on through streets, but the rank of sense of community for people on dead-end streets is higher. In connection to this finding, my second hypothesis must be discussed.

My second hypothesis predicted that respondents who talk to their neighbours beyond a greeting and have developed positive relationships will have a higher sense of community. This hypothesis was correct. Of the respondents who said they talk to their neighbours beyond a greeting daily or weekly, all (100%) of them had a fair or high sense of community. Of the

respondents who never talk to or talk to their neighbours once every year beyond a greeting, 83.3% reported to have no or low sense of community. These statistics contribute to the disagreement in current literature about the contact hypothesis, as previously mentioned, on whether or not more interactions will increase one's sense of community (Festinger, 1950; Lu et al., 2022). This study alludes to the conclusion that for southern Ontario high school students, people who develop deeper relationships with their neighbours will have a higher sense of community with those neighbours.

Limitations and Future Directions

This study's main limitation is that the sample was not randomly selected. Voluntary sampling was used to acquire survey responses to ensure this study was ethical, but voluntary sampling likely led to non-response bias. For example, students who are interested in urban design or sense of community may be more inclined to fill out the survey. In turn, this led to a small sample size, which is another limitation. There are a total of around 240 students in Grade 7 to 12 at the surveyed school, but I only received 17 responses. This small response rate means that this sample may not represent the entire population. If more time was available, non-response bias could be reduced by keeping the survey open for a longer period of time and sending out reminders to the study population to complete the survey.

The scope of this study is also limited as the sample chosen to complete the survey was decided due to accessibility and feasibility. If researchers had access to more high schools in different areas of southern Ontario, more studies could be completed to gain a more accurate understanding of the experiences of all southern Ontario high school students. As well, this study only focuses on studying whether residential street type affects high school students' sense of

community. Future studies could explore the reasoning why street type affects sense of community and social interactions.

This study's results have significant implications for future studies. Urban planners, families with kids, and high school students would be interested in learning the results of my conducted study since the conclusions of this study could show if specific street types will increase a high school student's sense of community and neighbourly interactions. By knowing what types of street promote a higher sense of community, urban planners designing cities in government projects could implement more of this street type in future neighbourhood planning. Another population that would care about this study is families who are looking for new housing, especially those that want or have kids. Since one's sense of community impacts physical and mental health (Farahani, 2016, p. 372), parents would want housing where their high school aged children would be best supported to have a sense of community and have positive wellbeing. Lastly, this study would be beneficial to high school students themselves because it would allow them to better understand the design of the street they live on is a factor towards their sense of community. Since high school students are the ones directly affected, they would also be able to explain why the conclusions of the study are happening, which could be useful for future studies that examine the reasoning behind why street types have a great, or minimal, impact on sense of community.

Conclusion

The goal of this study was to answer the research question: *What is the effect of residential street type on the sense of community of southern Ontario high school students?*

By using a mixed-methods approach, the quantitative data could be analyzed to easily find common trends between respondent's residential street type, sense of community, and social

interactions with neighbours. Furthermore, the qualitative data allowed me to better understand each respondent's perspective. This study found that high school students who live on dead-end streets talk to and know less of their neighbours compared to those who live on through streets; however, the sense of community ranking for high school students who live on dead-end streets is higher compared to students who live on through streets. There also seems to be a connection between sense of community and how often high school students interact with their neighbours beyond a surface-level greeting. The more often high school students take the time to develop deeper, positive relationships with their neighbours, the higher their sense of community is.

The results of the study are significant to the field of urban planning because there has been limited scholarly research about how street design affects the sense of community of adolescents. Overall, understanding how residential street type affects sense of community is important because an adolescent's housing situation is crucial to their individual growth and community development.

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Appendix A

Survey Distribution Request

Email to school administrator	<p>Good morning [Name],</p> <p>Thank you very much for agreeing to help me with distributing my AP Research Survey. I really appreciate your help. As you know, my project is about the effect of neighbourhood street type on one's sense of community, and I am trying to survey high school students to find out about their neighbourhood design and level of sense of community. Please copy and paste the message below and distribute it to the Grade 9-12 Edsby grade pages. This survey will only remain open until Monday, February 13, 2023, so it would be so great if you could send it out as soon as possible.</p> <p>Thanks again for all of your help! [Name]</p> <p>Here is the message I would like you to post to the grade pages:</p> <p>I am a Grade 12 student taking the AP Capstone Research course. You have been chosen in my survey sample, and I would really appreciate you completing my survey about the effect of neighbourhood design on sense of community. It should only take approximately 10 minutes, and should be completed before Monday, February 13, 2023. Here is the link to the survey: [link]</p>
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Appendix B

Informed Consent Letter

Please read the following information which is intended to help you decide if you wish to participate in the present research study. No signature on this form is required for consent. You will be asked to consent through a checkbox via the Google Form.

Please be aware that participation in this study is completely voluntary. If you do decide to participate, you may stop participating at any time, without justification or consequence, and you may opt out of answering any question(s) you choose. If you decide not to participate, there will be no negative consequences.

Title of project:

Effect of Residential Street Type on Sense of Community

Purpose of project:

The purpose of this project is to explore how types of residential streets have an effect on the sense of community of southern Ontario high school students.

Method/Procedure:

To answer my research question, I will conduct a mixed methods survey with a cross-sectional design dominated by quantitative data. The first section of my survey will ask respondents to confirm their grade and if they currently live in southern Ontario to eliminate responses outside of the study population.

Quantitative data is used when the variables are known (Leedy & Ormrod, 2013, p. 96). There are commonly known aspects of street design, which is why questions with multiple-choice answers are the chosen method to collect information about the type of street the

respondent lives on. Participants will then have an opportunity to describe their neighbourhood with a free-response question.

Then, participants will rank their levels of sense of community and community engagement on a Likert scale. Again, the participants will have an opportunity to describe the interactions they have with their neighbours and provide reasoning for their respective sense of community ranking. Generally, the qualitative data will support information from the quantitative questions, because it can reveal ideas about sense of community and street type that may not have been considered in the creation of the survey.

I will distribute my survey using the online platform Google Forms, because it can be distributed to a large population and results can be returned immediately. As well, it can anonymously collect both quantitative and qualitative data to then make generalizations about a population via studying a sample of that population (Creswell, 2014, p. 41).

The survey will be distributed to students in southern Ontario high schools. This sample group is a desirable population to study because Civics and Geography courses are mandatory in the Ontario curriculum, so respondents should have a basic understanding of street types. Prior to distribution, a proposal for the project was submitted to the Institutional Review Board at the researcher's school and the project was approved.

Estimated time required for participation:

This survey should take approximately 10 minutes to complete and is a one-time commitment.

How confidentiality will be maintained:

The survey is completely anonymous and confidential, so individual responses will not be shared, and responses will not be connected back to respondents. The Google Form settings

will ensure that email addresses, or other identifiable information will not be collected; if identifying information is included in a response, it will not be used in the data analysis and will not be included in the final report.

Potential risks/discomforts:

There could be potential risks of psychological discomforts, given that participants will be asked about their personal sense of community. To minimize the risks, all questions other than demographic data to exempt invalid responses will be optional. Further, it will be clear that the survey can be exited at any moment without consequence. Additionally, survey questions will not be overly personal.

Benefits:

My study is beneficial because it will bridge the gap in research about how residential street type affects the sense of community of high school students. Specifically, this study would be significant to the city design and neighbourhood planning. The conclusions of this study could show what street types tend to encourage a higher sense of community, and urban planners could implement more of this street type in future neighbourhood planning.

The level of sense of community is an important concept to study, because it can affect the physical and mental well-being of residents. Another population that would care about this study is families who want or have kids because they would likely want housing that their high school aged children enjoy and thrive best in.

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Pearson Education, Inc.

Please do not hesitate to ask questions about the study. **Your responses will be anonymous, and your name will not be associated with the research findings in any way.** Please direct any questions you may have to:

AP Capstone Research Teacher: [name]

E-mail address: [research supervisor's email]

Thank you.

Sincerely,

AP Capstone Researcher

[Derived from: Creswell, J. W. Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research (3rd ed.). Upper Saddle River, NJ: Pearson Education, Inc., 2008, p.159; and, International Rules: Guidelines for Science and Engineering Fairs 2015-2016 (AP Capstone Research training, Arlington, Texas, June 2017)].

Appendix C

Survey

Section Heading	Instructions and Questions
Sense of Community Survey	<p>Thank you for taking the time to participate in my AP Research survey. The purpose of this study is to explore how the types of residential streets have an effect on sense of community. The survey will contain 3 short sections asking you to assess your neighbourhood and sense of community, and should take no more than 10 minutes to complete.</p> <p>The survey is completely anonymous and confidential, so your individual responses will not be shared, and responses will not be connected back to you; names, email addresses, or other identifiable information will not be collected. Please do not include any specific identifying information about your neighbourhood to ensure anonymity (ex. Name of street). You can close the survey at any time, with no consequences. A link to the informed consent letter can be found here: [link]</p> <p>If you have questions about this study, please contact my research supervisor [Name] at [email]. This survey will remain open until Monday, February 13, 2023.</p>
Informed Consent	<p><input type="checkbox"/> By checking this box, I confirm that I have read and understand the informed consent letter and freely give my consent to participate in this survey. If I am under 18, I have informed my parent/guardian that I will be completing the survey.</p>
Demographic Information	<p>If you are not currently in one of the grades below and/or do not live in southern Ontario, please exit the survey. Thank you for your interest.</p> <p>1. What grade are you in?</p> <p><input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/> 12</p> <p>2. Do you live in southern Ontario?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>
Residential Street	The following questions will ask you to describe the neighbourhood

	<p>that you currently reside in. All the questions are referring to the street that you currently live on.</p> <p>3. What building type do you live in?</p> <p><input type="checkbox"/> Single-detached house (house is not attached to another house)</p> <p><input type="checkbox"/> Semi-detached house (one side of the house is attached to another house)</p> <p><input type="checkbox"/> Townhouse (both sides of the house is attached to another house)</p> <p><input type="checkbox"/> Apartment building (building containing several separate housing units)</p> <p><input type="checkbox"/> Other: _____</p> <p>4. What type of street do you live on?</p> <p><input type="checkbox"/> Linear through street (both ends of a linear shaped street can be entered/exited by a vehicle)</p> <p><input type="checkbox"/> Curvilinear through street (both ends of a curvy shaped street can be entered/exited by a vehicle)</p> <p><input type="checkbox"/> Dead-end street (only one end of the street can be entered/exited by a vehicle)</p> <p><input type="checkbox"/> Dead-end street with bulb shaped cul-de-sac (the end with no entrance/exit is a circular turn-around space)</p> <p><input type="checkbox"/> Other: _____</p> <p>5. What is the directionality of your street?</p> <p><input type="checkbox"/> One-way street</p> <p><input type="checkbox"/> Two-way street</p> <p>6. Is your street a major or minor road?</p> <p><input type="checkbox"/> Major road (commonly used streets that go through main parts of the city)</p> <p><input type="checkbox"/> Minor road (side roads that branch off of major roads)</p> <p>7. How busy is your street, in terms of pedestrian and vehicle activity? (1 = not busy, 2 = somewhat busy, 3 = fairly busy, 4 = very busy)</p> <p><input type="checkbox"/>1 <input type="checkbox"/>2 <input type="checkbox"/>3 <input type="checkbox"/>4</p> <p>8. How long have you lived on this street?</p> <p><input type="checkbox"/> Less than 1 year</p> <p><input type="checkbox"/> 1 to 5 years</p> <p><input type="checkbox"/> 6 to 10 years</p> <p><input type="checkbox"/> Over 10 years</p> <p>9. Describe, in your own words, your neighbourhood, including the design of your street.</p>
Community	The following questions will ask you about the community in your

	<p>neighbourhood. The term “neighbour” refers to the other residents living within close proximity to you and on the same street as you.</p> <p>10. How many neighbours do you know? (1 = none, 2 = some, 3 = most, 4 = all) <input type="checkbox"/>1 <input type="checkbox"/>2 <input type="checkbox"/>3 <input type="checkbox"/>4</p> <p>11. How many neighbours have you talked to beyond a greeting? (1 = none, 2 = some, 3 = most, 4 = all) <input type="checkbox"/>1 <input type="checkbox"/>2 <input type="checkbox"/>3 <input type="checkbox"/>4</p> <p>12. How often do you greet your neighbours? <input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Yearly <input type="checkbox"/> Never</p> <p>13. How often do you talk to your neighbours beyond a greeting (ex. Lending tools, Having a meal)? <input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Yearly <input type="checkbox"/> Never</p> <p>14. Do you have more positive or negative interactions with your neighbours? (1 = more negative, 2 = neutral, 3 = more positive) <input type="checkbox"/>1 <input type="checkbox"/>2 <input type="checkbox"/>3</p> <p>15. Do you interact more with the neighbours on your street or with the neighbours on surrounding streets? <input type="checkbox"/> Neighbours on my street <input type="checkbox"/> Neighbours on surrounding streets <input type="checkbox"/> Equal interactions with both groups <input type="checkbox"/> No interactions with neither group</p> <p>16. Describe, in your own words, the kinds and frequencies of interactions you have with your neighbours.</p> <p>17. Rank your sense of community with your neighbours. (1 = no sense of community, 2 = low sense of community, 3 = fair sense of community, 4 = high sense of community) <input type="checkbox"/>1 <input type="checkbox"/>2 <input type="checkbox"/>3 <input type="checkbox"/>4</p>
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	<p>18. Is it important to you to feel a sense of community with your neighbours? (1 = not important, 2 = somewhat important, 3 = fairly important, 4 = very important) <input type="checkbox"/>1 <input type="checkbox"/>2 <input type="checkbox"/>3 <input type="checkbox"/>4</p> <p>19. Do you feel that your neighbours know and value you? (1 = no, 2 = somewhat, 3 = fairly, 4 = yes) <input type="checkbox"/>1 <input type="checkbox"/>2 <input type="checkbox"/>3 <input type="checkbox"/>4</p> <p>20. Do you feel that you belong in your neighbourhood? (1 = no, 2 = somewhat, 3 = fairly, 4 = yes) <input type="checkbox"/>1 <input type="checkbox"/>2 <input type="checkbox"/>3 <input type="checkbox"/>4</p> <p>21. Describe the reasoning behind your ranking of sense of community with your neighbours.</p> <p>22. Do you feel that the type of street you live on influences the interactions you have with your neighbours and/or the sense of community you feel with them? Please explain.</p>
Conclusion	<p><input type="checkbox"/> By checking this box, I understand that my role in this survey is complete. I can request to receive the final research report with a summary of the overall results by contacting my research supervisor [Name] at [email].</p>

Academic Paper

Note: Student samples are quoted verbatim and may contain spelling and grammatical errors.

Sample: D**Score: 4**

This paper earned a score of 4. The topic of inquiry is focused with clear and narrow parameters, as evidenced on page 7: “*What is the effect of residential street type on the sense of community of southern Ontario high school students?*” The literature review explicitly connects the topic of inquiry to relevant scholarly works from pages 3–7. For example, on the bottom of page 6, the paper cites research from Coley & Leventhal, 2013 to suggest, “Young children spend a lot of time in the neighbourhood they live in, which is why it is inevitable that their housing situation will influence their psychological, social, and physical growth.” There is a logical consideration of how the topic of inquiry addresses the gap that ultimately led to the research question provided above. The method is not only replicable but also logically defended to the purpose of the inquiry. An example of this is found on page 8: “This is a modified version of the Sense of Community Index developed by McMillan & Chavis (1986) to measure sense of community.” The paper also defends the choice of Ontario on page 8: “This sample group was chosen because of feasibility of access, and it is a desirable population to study because Civics and Geography courses are mandatory in the Ontario curriculum, so respondents should have a basic understanding of street types.” Importantly, the paper acknowledges ethical considerations with a mention of IRB approval on page 8. It is also important to note appropriate use of a survey to effectively discover the *perceptions* of the participants regarding the sense of community that results from the design of their residential street. Even though the survey only had 17 respondents, this limitation is addressed on page 20: “This small response rate means that this sample may not represent the entire population.”

This paper did not earn a score of 5 because the limitations of the new understanding are oversimplified. In addition, although the paper makes an attempt to address the community of practice on page 20, “These statistics contribute to the disagreement in current literature about the contact hypothesis, as previously mentioned, on whether or not more interactions will increase one’s sense of community (Festinger, 1950; Lu et al., 2022),” overall, the relevance of the new understanding to the community of practice is underdeveloped.

The paper did not earn a score of 3 because the method is logically defended to the purpose of the inquiry. The student-generated data is more than sufficient evidence, and the line of reasoning is logically organized and supported by the student-generated data. For example, on page 22, “This study found that high school students who live on dead-end streets talk to and know less of their neighbours compared to those who live on through streets; however, the sense of community ranking for high school students who live on dead-end streets is higher compared to students who live on through streets.”