Understanding the Why and How of Rural Vermont Makers

An Exploration of How Purpose Affects Use

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SOCY11: Research Methods

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Literature Review

Rural communities often face limited access to specialized equipment, training opportunities, and entrepreneurial support, making it harder for residents to turn creative skills into economic or community opportunities (de Guzman et al. 2020; Muske and Woods 2004). One response to these challenges has been the rise of makerspaces, shared spaces that provide access to tools, technology, and collaborative work environments where people can design, repair, craft, or build things that might otherwise be difficult to create independently (Ensign and Leupold 2018; Martin 2015). The people who use these spaces, broadly referred to as makers, include hobbyists, artists, craftspeople, entrepreneurs, and people interested in learning new skills (Martin 2015). While makerspaces are often associated with innovation and entrepreneurship in urban areas, evidence suggests their role in rural communities may be broader, supporting not only business development but also creativity, cultural preservation, and social connection (Ensign and Leupold 2018). Understanding why people participate in making is especially important for organizations like the Black River Innovation Campus (BRIC), since the goals people bring into a makerspace, or into making more generally, likely shape how they use the space and what kinds of programming or equipment would best support them.

Existing research suggests that rural entrepreneurship and making are strongly shaped by social context and community relationships rather than individual ambition alone. Rural entrepreneurs often depend on social capital, local trust, and collaborative networks to gain resources and reduce geographic isolation (Townsend et al. 2016; Lang and Fink 2019). At the same time, microbusinesses are often shaped by household dynamics and economic necessity rather than purely entrepreneurial ambition, meaning people may engage in making for supplemental income, personal fulfillment, or practical needs rather than formal business creation (Ram, Jones, and Villares-Varela 2002; Muske and Woods 2004). Research on the maker movement similarly finds that making frequently emphasizes experimentation, creativity, and collaborative learning, especially in environments where skill-building and participation matter alongside economic outcomes (Martin 2015). Together, this literature suggests that people may participate in making for a variety of economic, cultural, and social reasons, though research has not yet fully explored how these differing motivations shape makerspace use in rural settings.

Research more directly related to rural makerspaces suggests that the purposes people bring into making likely influence how they use shared spaces. Dammicco and Diaz-Zagarra (2025), studying rural makerspaces in Germany, identify three broad purpose orientations among makerspace entrepreneurs: economic, cultural, and social. Economically oriented makers prioritize economic growth and profit, culturally oriented makers emphasize local identity and creative expression, and socially oriented makers focus on community-building and cohesion. Their findings suggest that makerspaces are not used for one universal purpose and that how people engage with these spaces may depend heavily on what they hope to gain from them. However, because their work focuses on established makerspaces and entrepreneurs, less is known about how these motivations operate among broader rural populations or potential users.

Research on enterprise hubs, shared workspaces where multiple businesses or entrepreneurs interact and collaborate, provides additional evidence that a person's motivations for making may shape how people use shared environments. Merrell et al. (2022) find that rural enterprise hubs reduce professional isolation by increasing organizational, communication, and social proximity between entrepreneurs. Similarly, Townsend et al. (2016) show that rural entrepreneurs rely heavily on face-to-face relationships to build trust and exchange resources, suggesting that makers with stronger social goals may be more likely to use shared spaces for collaboration and networking. Yet most of this literature focuses on established business owners rather than casual makers or people still deciding whether entrepreneurship is for them.

Community embeddedness may also influence how makers engage with spaces like BRIC. Lang and Fink (2019) argue that entrepreneurship is deeply shaped by local institutions and social relationships, while Shitile, Syrrakos, and Emediegwu (2025) distinguish between rural entrepreneurship, which is rooted in local identity and relationships, and in-the-rural entrepreneurship, which simply occurs in a rural place without meaningful community integration. Similarly, Wilson, Harrington, and Kevill (2022) find that some rural enterprises become deeply embedded in their communities while others remain largely disconnected from local life. These findings suggest that makers who view Springfield and the surrounding community as central to what they create may use shared spaces differently than those focused primarily on external markets. However, existing studies rarely examine how rural residents themselves understand these differences or how community context shapes their interest in makerspaces.

Despite growing research on rural entrepreneurship and makerspaces, there is still limited research examining how rural residents themselves understand makerspaces or how the purposes for which people make influence the ways they use these spaces. Much of the literature focuses on urban settings, formal entrepreneurial outcomes, or existing makerspace participants, leaving smaller rural communities underrepresented (Ensign and Leupold 2018; Martin 2015). This gap is particularly important for BRIC, which seeks to better understand both current users and people who may be interested in making but have not yet engaged with a formal makerspace. To address this gap, this study asks: In Springfield, Vermont, how does the purpose for which people make affect their use of the spaces in which they make?

Measures and Methods

Our conceptual model includes two overarching variables: our independent variable purpose and our dependent variable use. We hypothesize that purpose influences use without any mediating or confounding variables. Our conceptual model for purpose includes three categories inspired by Dammicco and Diaz-Zagarra (2025): Economic, Cultural, and Social. Our conceptual model for use includes two overarching categories: manufacturing and social.

Economic purpose corresponds to makers with “classical” economic goals, such as making a profit through selling the objects they make. To measure economic purpose, we use the percentage of goods a maker has sold out of all the goods they have made. This measure gives a sense of the degree to which a maker is engaged in selling, without requiring more sensitive or difficult-to-report information such as their lifetime earnings or specific sale numbers. Cultural purpose corresponds to makers whose work is informed by local customs and who aim to preserve local culture and traditions through creative expression. We measure cultural purpose through how makers design the products they make, with cultural makers being those who design their own goods versus using pre-defined templates, and through how makers learned to make, with those learning from community sources such as local artisans or workshops being more likely to incorporate those practices into their work. Finally, social purpose corresponds to makers who view making as a means to connect with others. We measure social purpose through a maker’s preference to work alone or with others and through their desire to attend community-based makerspace events.

Manufacturing use corresponds to creating goods through making. We operationalize manufacturing use through the materials which a maker uses and the machines which they use. Social use corresponds to a maker's actual use of making as a way to connect with others (not their desire to do so, which might not translate into action). We measure social use through the frequency with which a maker collaborates with others and the number of friends they have made through making.

For this research, we recommend survey methods, specifically an online, cross-sectional computer-assisted self-interview (a discussion of alternate research methods can be found in Appendix D). We use a cross-sectional design as BRIC is primarily interested in current attitudes, not change over time, and a longitudinal study would only impose additional cost without clear benefit. Our survey instrument can be found in Appendix A. Based on our pre-testing of five makers, the survey takes roughly two to five minutes to complete, which should boost response rates compared to a longer survey. Our pre-testing group additionally confirmed there was no confusing wording, technical issues, or unclear response options.

To run the study, BRIC should distribute our finalized survey instrument via the channels described in Sampling and Recruitment. After two weeks, BRIC should check the number of respondents, and if they do not exceed the targets in Data Interpretation, BRIC should re-distribute across all channels for another two weeks, targeting zip codes with low participation for additional in-person flyers (e.g., posting additional flyers in community locations in those zip codes). After all responses are collected, BRIC should analyze the data in accordance with Data Interpretation, following the handling and retention practices in Appendix F.

Sampling and Recruitment

Our target population is all makers in the Springfield area, both those who have used BRIC and those who have not. We recommend the use of non-probability sampling methods, specifically convenience sampling across a variety of channels selected to reach both BRIC and non-BRIC users (a discussion of alternate sampling methods can be found in Appendix E). The survey will be distributed through BRIC's existing digital channels, such as social media (Instagram, Facebook, X, etc.) and BRIC's website, as well as through the town newspaper, listserv, and physical flyers with QR codes that will be posted at high-traffic community locations and message boards (Black River Innovation Campus n.d.). Participants will be able to access the survey via a shared link, either digitally or by scanning a QR code with their phone. Upon opening it, they will be met with a brief introduction explaining the study's purpose, how their input will be helpful, who will view the responses, and a consent brief. Recruitment materials for each medium can be found in Appendix C.

To incentivize participants, we recommend offering each participant who completes the survey the option to enter a raffle for BRIC event tickets. BRIC has successfully used this strategy in the past, and its cost of roughly $140 is feasible for BRIC. See Appendix F for more details.

As discussed in the data interpretation section, our analysis strategy relies on dividing the population of survey respondents into subgroups. Therefore, we recommend at least 100 respondents to ensure each subgroup has enough respondents to draw meaningful conclusions.

Data Interpretation

To answer our research question, we must first identify which respondents make for which purposes. We recommend classifying all respondents who sell over 50% of their goods or intend to sell their goods as economic makers, respondents who learned through a local artisan or community workshop and use original or partially adapted designs as cultural makers, and respondents who are at least somewhat likely to attend makerspace events and at least somewhat prefer to work with others as social makers (see Appendix G for how these correspond to specific questions). Notably, a single respondent can have multiple purposes. We then recommend dividing the responses into each purpose group, and computing the relative frequencies of answers for the machines, materials, number of friends, and number of social interactions questions selected by each group. We also recommend comparing these frequencies to the overall relative frequencies across all respondents. This data can provide insights into how makers with different purposes differ in their use of the makerspace, and aid BRIC in tailoring their programming for specific segments of the maker population. For instance, if BRIC would like to target primarily economic makers (e.g., to support local microbusinesses), they can buy the machines and materials these makers commonly use. Additionally, if certain groups of makers use making socially (e.g., economic makers networking), BRIC can use this information to justify hosting additional community events.

We anticipate that economic makers will be more likely to use less specialized production-oriented tools and materials, such as 3D printers and laser cutters, since these machines enable scalable, sellable products. Additionally, we expect these makers to have moderate social use, as networking in the makerspace can help with their economic goals (Merrell et al. 2022). We predict cultural makers are more likely to use traditional or locally sourced materials and higher-skill specialized tools more suitable to creative work and have the least social use, as they make primarily as a form of creative expression. Finally, we expect social makers to use low-skill, easy-to-work-with tools and materials, as they make primarily to socialize, and have higher social use.

Our survey can also provide insights into which population segments would be most interested in using BRIC. Across all respondents and within each purpose group, we recommend computing the relative frequencies of BRIC familiarity, BRIC makerspace use, and factors influencing makerspace use. This will provide a heuristic into how well BRIC's makerspace offerings have reached the Springfield population and certain subpopulations that BRIC might not have reached, which BRIC may wish to target with specialized programming Causality is not possible to establish through our methods; see Appendix E for further discussion.

Ethical Considerations

This study was designed with attention to the three core principles of the Belmont Report: respect for persons, beneficence, and justice (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research 1979).

Respect for persons holds that research participation must be genuinely voluntary and based on adequate disclosure of the study's purpose and procedures (NCPHSBBR 1979). Because many respondents likely have an existing relationship with BRIC, as members, event attendees, or community partners, there is a risk that participants may not feel fully free to decline or answer honestly. We address this through a consent form at the beginning of our survey (see Appendix A) as well as a longer form consent form (see Appendix C). These name BRIC as both the survey distributor and recipient of findings, stating that participation is voluntary, and making clear that any question can be skipped without penalty. Additionally, raffle entry is separated into an optional question at the end of the survey that does not require any specific questions to be answered. Therefore, our survey incentive is never conditional on full completion. BRIC staff should avoid following up individually with non-respondents, especially those affiliated with BRIC, as excessive personal outreach could undermine voluntary participation.

Beneficence requires maximizing potential benefits while minimizing risks or harms to participants (NCPHSBBR 1979). The most sensitive data we collect involves questions about selling activity and zip code. In a small community where BRIC personally knows many respondents, questions surrounding finances or selling activity could make respondents feel uncomfortable or pressured. To minimize this, the survey limits questions to percentages rather than requesting specific dollar amounts, and every question is optional. Additionally, information like zip code, combined with other information in the survey, could be personally identifiable. BRIC should therefore store the data in ways that ensure confidentiality (Appendix F).

Justice requires that the benefits and burdens of research be distributed fairly rather than disproportionately distributed (NCPHSBBR 1979). Distributing the survey only through BRIC's existing digital channels risks skewing the respondent pool toward those already connected to the organization, biasing makerspace upgrades towards the needs of this group. To address this, BRIC should prioritize non-digital distribution such as physical flyers in locations such as community bulletin boards where they can reach respondents not affiliated with BRIC. Our question asking for participant zip code is also designed to ensure outreach can target all areas of Springfield, especially those with few respondents initially. The final report should acknowledge these sampling limitations so findings are not overgeneralized beyond what the data can support.

Feasibility and Significance

BRIC is a small nonprofit makerspace operating in Springfield, Vermont, with limited staff. This study was designed with those constraints in mind. The online survey format requires no specialized research training, no in-person coordination, and no involvement from the Dartmouth research team after the handoff. Largely cost-free distribution through existing online BRIC channels and community postings keeps costs low, and the single-phase design eliminates complicated sequencing or follow-up data collection. The survey relies on multiple-choice and ordinal questions throughout, meaning basic analysis can be generated automatically through platforms like Google Forms or SurveyMonkey (which we use to construct the survey).

This study addresses a consistent gap in the rural entrepreneurship and makerspace literature. Existing research documents how community embeddedness and collaborative spaces can support rural entrepreneurship, but far less work examines how rural residents, especially those who are not yet formal entrepreneurs, actually perceive and decide whether to engage with these makerspaces. This study generates community-level data on awareness, purpose, and engagement across both current BRIC users and broader Springfield-area makers, and applies Dammicco and Diaz-Zagarra's (2025) three-part purpose typology in a New England context, contributing one of the first U.S. applications of that framework.

Practically, the findings from this study can inform BRIC's makerspace expansion. The familiarity question allows BRIC to compare responses across three distinct subgroups: current users, community members aware of BRIC but who haven't visited, and makers entirely unfamiliar with the organization, clarifying who BRIC is currently reaching and where barriers to entry exist. The purpose and manufacturing use questions show how economic, cultural, and social orientations correspond to interest in specific equipment and programming, and the open-ended barrier question provides direct language usable in grant applications. Together, the findings will give BRIC a foundation for designing programming around what the community actually wants and needs.

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Appendix A - Survey Instrument

Link to Google Survey: https://forms.gle/Y6eWnHMbqjxwJmK99

Title: Making and Makerspace Use in the Springfield Community

The Black River Innovation Campus (BRIC) is a nonprofit innovation hub located in Springfield, Vermont, whose mission is to support local economic development through STEAM education, startup incubation, and community programming. BRIC operates a makerspace equipped with tools like 3D printers, laser cutters, and vinyl cutters that are open to community members for creative, entrepreneurial, and educational use.
This survey is being conducted to help BRIC better understand how local residents use or might want to use the makerspace, so they can make informed decisions about equipment, programming, and outreach that best serve the Springfield community.

----------- Consent -----------

By continuing with this survey, you confirm that you are at least 18 years old and voluntarily agree to participate in this research conducted by and on behalf of BRIC, covering topics including your making activity, business practices, community relationships, and interest in BRIC programming. Participation is entirely voluntary. You may skip any question or stop at any time without penalty.
Some questions ask about business and general sales activity. You are welcome to skip any question you do not wish to answer without penalty.
Your responses will be kept confidential within BRIC's internal research team, will not be shared with any outside organization, and will be reported in aggregate form only.
Raffle entry is optional and handled through a separate question at the end of the survey, so your choice to enter has no effect on how your responses are treated. If you choose to enter the raffle, your email address will be deleted after winners are drawn unless you separately opt in to receive follow-up communications from BRIC. You will have the opportunity to make that choice at the end of the survey.

Are you at least 18 years old?

- ☐ Yes
- ☐ No

Do you live or work in Springfield, Vermont or a nearby community?

- ☐ Yes
- ☐ No

What is your ZIP code?
Short Answer: ________________

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Your Making Activity

How often do you currently make, craft, or build things?
- ☐ I regularly make, craft, or build things
- ☐ I occasionally make, craft, or build things
- ☐ I don't currently make things but I'm interested in starting
- ☐ None of the above

How did you learn to make, craft, or build?
- ☐ From a local craftsperson, artisan, or mentor in my community
- ☐ Self-taught through YouTube, online tutorials, or books
- ☐ Through formal classes at an educational institution
- ☐ Through a makerspace or community workshop
- ☐ I haven't started yet, but I am interested
- ☐ Other:

Which best describes how you typically develop what you make?
- ☐ Fully original designs or ideas of my own
- ☐ Adapting or modifying existing templates, patterns, or designs
- ☐ Using existing templates, patterns, or designs without modification
- ☐ I don't make things yet

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Your Purpose

What percentage of what you make do you sell, or plan to sell?
- ☐ Less than 25%
- ☐ 26–50%
- ☐ 51–75%
- ☐ More than 75%
- ☐ I don't sell and don't plan to
- ☐ I plan to sell but haven't started yet

How likely are you to attend community events at a shared workspace or makerspace – such as workshops, skill-sharing sessions, or open studio nights?
- ☐ Very unlikely
- ☐ Unlikely
- ☐ Neutral
- ☐ Likely
- ☐ Very likely

When working on making or building projects, do you prefer working alone or with others?

- ☐ Strongly prefer working alone
- ☐ Somewhat prefer working alone
- ☐ No preference
- ☐ Somewhat prefer working with others
- ☐ Strongly prefer working with others

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How You Make

What materials do you most commonly work with or would you be most interested in working with?

- ☐ Wood
- ☐ Fabric or textiles
- ☐ Vinyl
- ☐ Plastic or resin
- ☐ Metal
- ☐ Electronics or components
- ☐ Paper or cardboard
- ☐ Other:

What equipment or tools do you use or would you be most interested in using to make?

- ☐ 3D printer
- ☐ Laser cutter
- ☐ Vinyl cutter
- ☐ Woodworking tools
- ☐ Sewing or textile equipment
- ☐ Metalworking equipment
- ☐ Electronics equipment
- ☐ Digital design software
- ☐ Other:

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Making and Community

How often do you interact with, get help from, or collaborate with other makers, whether through a makerspace, a community event, or informally?

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often
- ☐ Very often

Through making, crafting, or building, how many people would you consider connections, collaborators, or friends that you met through these activities?

- ☐ 0
- ☐ 1–2
- ☐ 3–5
- ☐ More than 5

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Familiarity with BRIC

Before this survey, how familiar were you with the Black River Innovation Campus (BRIC)?

- ☐ I know about BRIC, and have visited the space
- ☐ I know about BRIC, but haven't visited the space
- ☐ I've heard of BRIC, but don't know much about it
- ☐ I wasn't familiar with BRIC before this survey

BRIC offers a makerspace containing a 3d printer, laser cutter, and vinyl cutter that is open to public use. Have you used this makerspace before?

- ☐ Yes (skip the next question)
- ☐ No (continue to next question)

What factors have influenced your decision not to use BRIC's makerspace?

- ☐ I wasn't aware of it
- ☐ It's too far away
- ☐ Cost
- ☐ Scheduling or time constraints
- ☐ Lack of experience with the equipment
- ☐ Not interested in the current equipment
- ☐ Not interested in the current programming
- ☐ I prefer working in my own space
- ☐ Other:

What kinds of classes, equipment, or resources would make you more likely to use BRIC's makerspace?
Short Answer: ____________________________

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About You

What age group are you in?

- ☐ 18–24
- ☐ 25–34

- ☐ 35–44
- ☐ 45–54
- ☐ 55–64
- ☐ 65+

What best describes your current employment situation?

- ☐ Full-time employed
- ☐ Part-time employed
- ☐ Self-employed/freelance
- ☐ Student
- ☐ Retired
- ☐ Other:

_____________________________________Page 7_____________________________________

Optional Raffle Entry

Thank you for completing the survey. As a token of appreciation, you are invited to enter a raffle for two sets of four tickets to a BRIC event. Entry is completely optional and has no effect on how your survey responses are used or your relationship with BRIC.

To enter, please provide your email address below.
Email address:_____________

Would you like to receive updates from BRIC about future programming, events, or opportunities at the makerspace?

- ☐ Yes, I would like to receive updates from BRIC
- ☐ No thank you

Thank You
Thank you for your time and participation. Your responses will help BRIC better understand how the community uses and thinks about makerspaces, and will directly inform future programming, equipment, and outreach decisions.

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Appendix B - Recruitment Materials

Social Media Recruitment Post:
Help Shape the Future of BRIC's Makerspace!
Do you create, build, craft, repair, design, or make things in Springfield or the surrounding area?
The Black River Innovation Campus (BRIC) is interested in learning how local community members use makerspaces, what kinds of projects they work on, and what resources or equipment would best support local makers.
We are inviting adults (18+) from Springfield and nearby communities to complete a short 2-5 minute survey. Your feedback will help BRIC improve future programming, equipment, classes, and community events.
https://forms.gle/Y6eWnHMbqjxwJmK99
Questions? Contact: innovate@bricvt.org

Flyer:
Are You a Maker?
Do you:
- Build or craft things?
- Use tools, machines, or creative equipment?- Sell handmade products?
- Create art, woodworking, designs, or prototypes?
- Want to learn more about makerspaces?

The Black River Innovation Campus (BRIC) is interested in learning how local community members use makerspaces, what kinds of projects they work on, and what resources or equipment would best support local makers.
Participate in a 2-5 Minute Survey
Open to adults (18+) in Springfield and nearby communities
Voluntary and confidential
Chance to win BRIC event tickets
Scan the QR code below or visit:
https://forms.gle/Y6eWnHMbqjxwJmK99

Questions? Email us at: innovate@bricvt.org

Newspaper Announcement:

The Black River Innovation Campus (BRIC) is conducting a community survey about makerspaces, entrepreneurship, and creative work in Springfield and surrounding communities.
The study seeks to understand how local residents use makerspaces, what kinds of projects they work on, and what resources or programming would best support community needs.
Adults ages 18 and older are invited to complete a voluntary 2-5 minute online survey.
Survey Link: https://forms.gle/Y6eWnHMbqjxwJmK99
Questions may be directed to innovate@bricvt.org

Email:
Subject: Got 5 Minutes? Help BRIC Understand What Springfield Makers Need

Hi neighbors!

We've put together a short community survey to learn more about how local residents make, build, and create. It doesn't matter if you have a fully equipped home workshop, if you occasionally craft on weekends, or if you've just been curious about trying something new. This survey is for all of you!

We're asking about what residents make, the tools you use, what you'd want out of a shared community space, and what would make our makerspace at the Black River Innovation Campus the best it could be!

The survey takes about 2 to 5 minutes and is open to anyone 18 or older who lives or works in Springfield or a nearby community.

Take the survey here: https://forms.gle/Y6eWnHMbqjxwJmK99

Your responses will go directly to BRIC leadership and will shape real decisions about equipment, classes, programming, and events. Everything is confidential and nothing is required so you're able to answer as your most authentic self.

As a small thank you, everyone who completes the survey will have the option to be entered into a raffle for tickets to a BRIC event, including VRmont Studios and drone soccer.

If you have any questions at all, feel free to reach out at innovate@bricvt.org or give us a call at 802.546.1940. We're happy to chat.

Thanks so much for taking the time! It really does make a difference.

Vin Fusca
Black River Innovation Campus
60 Park Street, Springfield, VT
bricvt.org

Appendix C - Consent Form

Survey Information and Consent Statement:

You are being invited to complete a brief survey as part of a research study conducted by Black River Innovation Campus (BRIC)

Purpose of the Study

The purpose of this study is to better understand how community members use or might use makerspaces, what goals they have for participating in makerspace activities, and what kinds of equipment, programming, and training opportunities would best support the Springfield-area community.

What Participation Involves

Participation involves completing a survey that will take approximately 2-5 minutes. Questions ask about:

Your familiarity with BRIC

Your experience with makerspaces

Your creative or entrepreneurial activities

The kinds of tools or materials you use

Your interest in makerspace events or collaboration

Voluntary Participation

Your participation is entirely voluntary. You may skip any question you do not wish to answer and may stop the survey at any time without penalty.

Risks and Benefits

This study involves minimal risk. Some participants may feel uncomfortable answering questions about business activities, finances, or community relationships. You may skip any question.

While there is no immediate benefit to you, your responses may help BRIC improve future makerspace resources, training programs, and community offerings, which you can then take advantage of through BRIC's programs. Additionally, participants who complete the survey will enter a raffle for BRIC event tickets.

Confidentiality

Your responses will be kept confidential. Survey responses will only be accessed by the BRIC research team, and we do not collect names or have it mandatory to collect identifying information. Any identifying information (such as ZIP codes and email addresses) are optional for the respondent to include and there is no penalty for withholding that information. Findings will not be shared with any other organization without your express written permission. Findings will be presented in aggregate form whenever possible.

Eligibility

You must be:

- At least 18 years old
- Living or working in Springfield or the surrounding area

Compensation

Participants who complete the survey will have the opportunity to enter an optional raffle for BRIC event tickets.

Questions

If you have questions about this study, please contact: innovate@bricvt.org

Appendix D - Justification of Research Methods & Discussion of Alternatives

We recommend survey methods for this research. Experimental research is not appropriate as our study needs a high degree of external validity, and any likely awkward setup required to manipulate purpose would severely harm this external validity (Dixon, Singleton, and Straits 2022). Existing data analysis is not appropriate as there is no readily available, centralized source of existing data to analyze. Similarly field research methods would be impractical, as the authors would have to observe non-BRIC users in their local or personal makerspaces, which is infeasible (Dixon, Singleton, and Straits 2022).

The one method we did consider instead of survey methods were qualitative, in-depth interviews. These interviews would allow BRIC to ask open-ended questions and follow up on responses, yielding higher quality data (Dixon, Singleton, and Straits 2022). However, they would also require significant resources getting respondents to BRIC for interviews, a large amount of time from BRIC staff to conduct interviews, and specialized training to conduct the interviews well and analyze the resulting data through methods such as deductive or inductive coding (Dixon, Singleton, and Straits 2022). Therefore, we chose survey methods due to these feasibility constraints.

Within survey methods, we chose online computer-assisted self-interviews as the most practical means of reaching a large, geographically dispersed population (over the Springfield area) that may or may not have an existing relationship with BRIC. Structured face-to-face interviews, while they would generate higher quality data, have the same problems as qualitative in-depth interviews, namely the resources required to bring in respondents and staff time to conduct the interviews (Dixon, Singleton, and Straits 2022). Telephone interviews, while they would generate high quality data, lack a central method of reaching participants for this work. BRIC can distribute a link to a survey over its social media platforms and other online methods, but convincing people to call a number rather than fill out a link is more difficult and onerous, leading to lower response rates (Dixon, Singleton, and Straits 2022). Paper-and-pencil questionnaires lack the digital distribution channels of computer-assisted self-interviews, limiting their reach, especially to respondents without a pre-existing relationship with BRIC (Dixon, Singleton, and Straits 2022). Finally, mixed methods are more complex, and the additional overhead they introduce is not justified for this study (Dixon, Singleton, and Straits 2022).

Additionally, as we use a cross-sectional design we cannot determine how purpose, use, or the relationship between them differs over time. This limitation does not seem relevant to BRIC's goals of using current data to plan expansions to their makerspace, but is worth considering. If BRIC is ever interested in determining change over a time, a similar design to the one we propose here could likely be used.

Overall, the fact we use survey methods, rather than more controlled methods such as experimental methods, increases the external validity of our results, as we are asking real-world makers about their thoughts and attitudes (Dixon, Singleton, and Straits 2022). However, as we do not use probability sampling, we cannot assume our conclusions generalize to the entire Springfield population, decreasing our external validity (Dixon, Singleton, and Straits 2022). Additionally, our use of convenience sampling may be biased towards certain makers within the population over others. Although we have taken steps to use a wide variety of distribution channels to reach as many people as possible, this could still adversely affect the external validity of our findings (Dixon, Singleton, and Straits 2022).

As we employ a self-administered online survey as our primary research instrument, our reliability is relatively low (Dixon, Singleton, and Straits 2022). We do not standardize response conditions, and respondents could be taking the survey from a variety of different environments. However, these trade-offs are required to reach both BRIC and non-BRIC makers under BRIC's resource constraints, while still allowing BRIC to draw heuristic conclusions on how to expand their makerspace.

Appendix E - Justification of Sampling Methods & Discussion of Alternatives

We recommend convenience sampling for this research. While probability sampling may allow us to conduct statistical analysis, it is not practical for this study. Makers in Springfield are a difficult population to reach (especially those who do not have a pre-existing relationship with BRIC), and there is no apparent sampling frame we can draw from, making a probability sample infeasible (Dixon, Singleton, and Straits 2022). Additionally, our data analysis does not require hypothesis testing to reach informative conclusions, lessening the justification for probability sampling (Dixon, Singleton, and Straits 2022).

Convenience sampling, on the other hand, meets several key criteria: it is resource efficient, allows BRIC to reach a larger population quickly, and avoids exhausting significant resources collecting a probability sample (Dixon, Singleton, and Straits 2022). We considered snowball sampling starting from users of the BRIC makerspace; however, as BRIC is interested in both current users of BRIC and makers outside of BRIC, this approach will likely over-weight current BRIC users. Therefore, we recommend standard convenience sampling across the channels mentioned in Sampling and Recruitment.

Notably, our choice of convenience sampling comes with several downsides. We cannot assume our findings generalize to the larger Springfield population, cannot conduct hypothesis tests, and cannot establish causality (Dixon, Singleton, and Straits 2022). However, heuristic findings would still provide useful data for BRIC in planning their makerspace expansion, and given the difficulties of probability sampling, we believe this method is the most appropriate for BRIC's goals and resources.

Appendix F - Data Handling Practices & Raffle

Throughout our survey, we specifically collect only low-risk data (e.g., percentage of goods sold as opposed to more sensitive sales or financial data). Nevertheless, we recommend BRIC strive for confidentiality in this study and ensure that personally-identifiable data is not shared outside of BRIC in any way without the express written consent of participants (Dixon, Singleton, and Straits 2022).

To that end, we recommend all survey responses be stored in a password-protected account accessible only to designated BRIC staff. No personally identifiable information other than an optional zip code will be collected as part of the main survey, but the optional raffle at the end requests the participant's email address if they would like to enter. This email address will be used to contact the raffle winners after the winners are drawn. A participant may opt in to future contact from BRIC (e.g., about future programming, events, or opportunities), in which case BRIC will retain their email address with their responses in the password protected account. If a participant opts out, their email will be deleted from their response after the raffle winners are drawn.

If this data is ever provided to a third party or released publicly, we recommend removing all emails and zip codes to protect confidentiality.

Appendix G - Survey Question Correspondence

Our economic purpose measure corresponds to the first question on page two, which asks respondents what percentage of the goods they have made has been or is intended to be sold. The next two questions on page two are centered on cultural purpose, as they ask how respondents design the things they make (completely original designs versus pre-existing templates or patterns) and how they learned to make them (from a local artisan or community workshop versus online tutorials, formal education, or self-teaching), respectively. Page three measures social purpose by having respondents rate their preference for working alone versus with others as well as asking how likely they would be to attend a community makerspace event. Page four covers manufacturing use by asking which materials respondents typically use and what tools or machines they use. Social use is then measured on page five by asking respondents how frequently they collaborate with other makers and an additional question about how many friends they have made through making.