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Demand pull versus resource push training approaches to entrepreneurship: A field experiment

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Abstract

Research Summary: We compare the efficacy of two broad approaches to entrepreneurship training: a training prioritizing demand-side activities versus a training prioritizing resource-side activities. We do so by running a field experiment inside a 6-month entrepreneurship program involving 236 early-stage entrepreneurs. Inspired by our training, the first group invested more time interacting with potential customers and developing a deep understanding of customer needs and problems. The other group, in contrast, spent more time identifying and exploiting their core resources such as their network. Our results reveal that the training prioritizing demand-side activities is substantially more effective. At the end of the program, the group exposed to the demand-side training acquired more than twice the number of customers and generated revenues 65% higher than the other group.

Managerial Summary: In this paper, we aim to identify effective practices for supporting nascent entrepreneurs amidst the proliferation of entrepreneurship training programs. In particular, we launched a 6-month entrepreneurship program involving 236 early-stage

entrepreneurs and exposed them to different training approaches. We discovered that a training approach focused on demand-side activities, such as identifying customer persona, collecting reliable customer information, and interpreting their feedback, is more effective in improving new venture performance than a training approach focused on resource-side activities such as helping entrepreneurs identify and leverage their resources and capabilities. Our findings emphasize the importance of developing skills related to customer analysis, market understanding, and collecting customer feedback during the early stages of a startup journey and can provide insights for designing effective entrepreneurship programs.

KEYWORDS
demand-side perspective, early-stage entrepreneurs, entrepreneurship training, field experiment, resource based view

1 | INTRODUCTION

Entrepreneurship training has seen a significant rise in attention, both in developed and developing countries (Gonzalez-Uribe & Leatherbee, 2018; Lyons & Zhang, 2018). In addition to business schools, specialized organizations now offer various entrepreneurship, incubation, and acceleration programs (Dutt et al., 2016). However, the effectiveness of entrepreneurship training in improving startup performance is still debated (Bhatia & Levina, 2020; Sarasvathy & Venkataraman, 2011). Only a few recent empirical studies have shed some light on this topic, proposing interventions that enhance entrepreneurial success and performance (Anderson et al., 2018; Camuffo et al., 2020; Chatterji et al., 2019; Kotha et al., 2022). We extend this line of research by building on a randomized field experiment inside an entrepreneurship program designed to compare the effectiveness of two training approaches for early-stage entrepreneurs: demand-pull and resource push.

The entrepreneurial process involves the interaction between identifying market opportunities (Shane, 2003) and mobilizing resources to pursue those opportunities (Clough et al., 2019). Prospective entrepreneurs engage in a process of exploration to learn about the market potential of their idea while collecting the necessary financial, human, and social capital. Notably, individuals considerably vary in how they search for opportunities and resources (Bennett & Chatterji, 2019; Clough et al., 2019). The choice and prioritization of different activities in the pre-entry stage are likely to affect entrepreneurs' learning process and ultimately new venture performance. However, there is limited empirical evidence on how early-stage activity prioritization affects the performance of new ventures. The lack of consensus is also evident in the proliferation of training methodologies designed to help entrepreneurs

successfully launch their ventures. While these methodologies share commonalities, they exhibit substantial variation in suggested early-phase activities. A common and intuitive distinction is between those that prioritize demand-side activities (e.g., collecting customer feedback) and those that prioritize resource-side activities (e.g., entrepreneur's network mobilizing). For simplicity, we refer to the former group as "demand pull" and the latter group as "resource push" (di Stefano et al., 2012).

According to entrepreneurship training methodologies inspired by the demand-pull approach, a deep understanding of customer needs and problems is the main determinant of a new venture's success. Entrepreneurs are encouraged to dedicate substantial time and effort in the early stages to gain a better understanding of their potential customers and achieve a good solution-market fit (Blank, 2013). Their resource mobilization should follow demand validation and adapt to the insights collected from customers. Popular training methodologies sharing these principles include customer discovery, lean experimentation, and design thinking. In contrast, the resource push approach prioritizes the identification of entrepreneurs' strategic resources and capabilities as the starting point and focus of the entrepreneurship process. Based on this view, the most successful entrepreneurs are those who can identify their strategic resources and use them to create new opportunities. Opportunity identification here is a by-product of the entrepreneur's resource mobilization. Entrepreneurship training methodologies based on these principles build on strategic management frameworks like SWOT, VRIO analyses, and the core competencies framework (Barney, 1991; Prahalad & Hamel, 1990), or on entrepreneurship theories such as effectuation that emphasize entrepreneurs' means and resources (Sarasvathy, 2001).

The demand-pull and resource push approaches to entrepreneurship training are not mutually exclusive, but they emphasize specific activities over others in the initial stages of a startup launch. Design thinking, for example, focuses on having a clear understanding of customers and empathizing with them before developing a new product (Liedtka & Ogilvie, 2011). Effectuation pays relatively more attention to leveraging the entrepreneur's means and resources (Sarasvathy, 2001). While both approaches have theoretical validity, the practical reality of entrepreneurship requires early-stage entrepreneurs to prioritize the activities that contribute the most value to startup success, and the specific sequence of the activities suggested for the initial startup phase varies substantially between the two approaches.

We compare the efficacy of demand-pull and resource push training approaches on startup performance by conducting a field experiment within a 6-month entrepreneurship program in Singapore. We randomly assigned 236 early-stage entrepreneurs to either demand pull or resource push groups. Inspired by our training, the demand pull group invested more time and resources during the initial months of the program interacting with potential customers and developing a deep understanding of their needs and problems. They then built a solution based on these identified problems and mobilized only necessary resources. The resource push group, in contrast, allocated more time identifying and leveraging their core resources (e.g., personal network or capabilities) and eventually built a solution as an application of their strategic resources with limited interest in customer feedback. At the end of the program, the demand-pull group acquired more than twice the number of customers and generated revenues 65% higher than the resource push group.

Our paper contributes to strategy and entrepreneurship research. We provide empirical evidence on the effectiveness of alternative strategies for opportunity search and resource mobilization (Clough et al., 2019)—one that prioritizes the customer side versus another that prioritizes the factor market side—connecting it to the growing literature on the most effective

interventions for nascent entrepreneurs (Chatterji et al., 2019; Nai et al., 2021). Our findings align with and complement recent empirical evidence on the importance of marketing skills (Anderson et al., 2018) as well as entrepreneurial skills to discover (Campos et al., 2017) and test new business opportunities (Camuffo et al., 2020; Koning et al., 2022) on the performance of nascent startups.

2 | THEORETICAL BACKGROUND

There is considerable variation in terms of type and intensity of activities performed by aspiring entrepreneurs in the process of launching their businesses. Some entrepreneurs initiate their entrepreneurial journey by mobilizing resources from their personal network or looking for partners with only a rough idea about market opportunities. Others spend more time collecting data about, interacting with, and observing potential customers before embarking on resource search (Bennett & Chatterji, 2019). The universe of entrepreneurship training methodologies adopted by business schools and startup accelerators reflects similar variations in recommended pre-entry activities (Laplume & Yeganegi, 2019). Despite some commonalities, training methodologies tend to differ in the prioritization of activities for nascent entrepreneurs and their interpretations of the relationship between opportunity recognition and resource mobilization (Clough et al., 2019).

A common distinction recurrent in the entrepreneurship and strategy literature is between methodologies emphasizing resource-side activities and those stressing demand-side activities (Priem et al., 2012; Priem & Butler, 2001). Effectuation, for example, highlights the importance of taking the entrepreneur's given set of means, relatively unalterable characteristics of the decision-maker, as the starting point for the entrepreneurial process (Sarasvathy, 2001; Sarasvathy & Venkataraman, 2011). In a Schumpeterian fashion, entrepreneurship is a self-discovery process where entrepreneurs learn how to best combine their key resources. Entrepreneurs should thus spend most of their time and effort early on to understand their values, competencies, and network. Similar principles can be found in entrepreneurship training methodologies based on strategy concepts, such as SWOT, VRIO analyses, or the core competencies framework (Barney, 1991; Prahalad & Hamel, 1990). While these approaches clearly do not ignore demand factors (e.g., market trends), the scope of market analysis is strictly tied to the identification of entrepreneurs' strategic resources.

Other training methodologies place relatively less emphasis on an entrepreneur's resources and capabilities in favor of developing a deep customer understanding. The demand-pull approach highlights that a detailed comprehension of customer needs and problems is the key success factor to entrepreneurial success. Entrepreneurs should thus spend most of their time and effort in the early stages of a startup to gain insights into their potential customers and find a good solution-market fit. Methodologies sharing similar principles include lean experimentation, customer discovery, or design thinking, which are quite popular among prominent startup accelerators or incubators.[1] Accelerator programs like Y Combinator or Techstars put a strong emphasis on customer discovery, especially at the beginning of the startup phase. "Understanding what customers want" is the central building block in the Techstars entrepreneurship curriculum (Techstars, 2021). The process involves several activities, such as identifying customer

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[1] For examples, see Y Combinator (www.startupschool.org/curriculum) or Techstars (toolkit.techstars.com).

problems before jumping into solution development and engaging frequently with customers (Liedtka & Ogilvie, 2011), all of which are supported by mentors within accelerators.

From a theoretical perspective, both resource push and demand pull approaches seem viable and relevant. However, we argue that depending on the venture stage, one approach can *add more value* to entrepreneurs than the other (Anderson et al., 2018). Anecdotal evidence from startup accelerators reveals that common early-stage startup mistakes often pertain to demand-side factors, such as targeting a generic market or overinvesting in product features.[2] Conversely, resource-side mistakes are less prevalent in accounts of new venture failure (Lance, 2016).[3] This suggests that entrepreneurs typically have a better understanding of their resources and close network than strangers who are potential customers. Gathering reliable information about prospective customers is often more challenging than collecting accurate information about entrepreneurs' resources. Supporting this observation, a survey of US startups during the pre-entry period demonstrated relatively infrequent engagement in demand-side activities such as testing demand or collecting feedback from customers (Bennett & Chatterji, 2019). In conclusion, we believe that *the demand pull approach to entrepreneurship training can add greater value to early-stage startups*, as it helps entrepreneurs prioritize activities effectively and avoid common startup mistakes.

Despite the recent popularity of demand-side approaches inside accelerator programs, there is still no academic consensus on which approach delivers the best results (Bhatia & Levina, 2020; Schrage, 2013). Scholars caution against listening to customer feedback too prematurely (Felin et al., 2020). Similarly, critiques of the resource-based view suggest that resources alone do not explain startup success (Priem et al., 2012). Startups typically have limited resources compared to established competitors, making it crucial for entrepreneurs to identify market niches where they can excel (Abolfathi & Santamaria, 2020). To contribute to this ongoing debate, our paper adopts an experimental approach, joining the emerging trend of using experiments in entrepreneurship (Camuffo et al., 2020; Chatterji et al., 2019; Kotha et al., 2022; Nai et al., 2021). This approach allows us to randomize entrepreneurs into two different training approaches, addressing endogeneity issues like self-selection or confounding factors. Given that we did not pre-register hypotheses for our study, we suggest readers treat our findings as exploratory.

3 | EXPERIMENTAL DESIGN

To collect evidence on the efficacy of alternative training approaches, we conducted a field experiment in partnership with a Singaporean organization specializing in entrepreneurship and accelerator programs.[4] Together we launched an entrepreneurship program designed to help ideapreneurs—individuals with a business idea but no established business in place—launch their new ventures. To maximize reach across the island, the program was advertised

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[2]A common mistake is targeting a large, generic market without a precise understanding of the ideal customer persona and the "granularity of customer needs" (Camuffo et al., 2022). Another common mistake is overinvesting in product features due to the sunk cost fallacy (Ho et al., 2017; Ries, 2011). Thus, entrepreneurs continue investing and wasting resources despite receiving negative customer feedback.

[3]Startups may team up with the wrong partner or enter an industry in which founders do not have the right expertise, but these mistakes are less common compared to the previously mentioned demand-side mistakes.

[4]The protocol of the experiment was approved by the NUS Institutional Review Board and implemented in accordance with the school regulations concerning the protection of the rights, safety, and welfare of human research subjects.

through online media and the partner organization's social network. Admission was not selective, but participants were asked to pay 100 Singapore dollars (SGD) to secure their commitment.[5] We ran the program for two consecutive rounds with a similar structure, the first starting on February 6, 2021, and the second a year later, on March 12, 2022. We accepted a total of 236 participants, with 164 in the first round and 72 in the second.[6]

The program lasted 6 months and comprised 24 workshops of about 2 hours each. The workshops were conducted online every Saturday via Zoom. Instructors were startup trainers and mentors, entrepreneurs, and experts who covered various topics relevant to startup launch. Participants were randomly assigned to either the demand-pull (treatment) or the resource push (control) group.[7] The two groups never interacted with each other until the end of the program. Both groups were exposed to the same content except for the first 5 workshops—our *intervention* phase. To minimize any difference between the groups, each workshop was conducted by the same instructor in sequence for each group throughout the program. Figure 1 shows the detailed structure of the program.

During the intervention phase, the demand pull group was taught methodologies that prioritize activities related to better customer understanding. In contrast, the resource push group received methodologies focused on identifying and leveraging core resources. More specifically, the content of the workshops diverged on three key areas of the startup process: ideation, business model, and minimum viable product (MVP).

3.1 | Ideation

In workshop 1 on ideation, we asked the demand pull group to frame their business ideas as a *solution to a user problem* using established practices in design thinking (Elsbach & Stigliani, 2018; Liedtka & Ogilvie, 2011; Micheli et al., 2019), the customer development approach (Silva et al., 2020), and the jobs-to-be-done framework (Christensen, 2016). The goal was to avoid the common pitfalls of targeting the wrong audience or solving irrelevant problems (Thompson, 2017). To achieve a good persona-problem-solution fit entrepreneurs were encouraged to frequently interact with potential customers through empathy interviews or observe them to better understand their habits, routines, behavior, and pain points with established solutions.

The approach used for the resource push group was drastically different. Building on the effectuation (Sarasvathy, 2001) and VRIO frameworks (Barney, 1991; Barney & Hesterly, 2010), we asked this group to frame their business idea as an *application of their core resources* and *capabilities*. Based on the idea that entrepreneurial opportunities are created, not discovered, the implicit assumption of this approach is that most entrepreneurs fail because they do not

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[5]The fees were collected by our partner organization and used to cover program expenses.

[6]Power calculations and the minimum detectable effect size are reported in the Online Appendix. A sample size of at least 220 observations is enough to detect an effect size of roughly 2000 SGD increase in revenue with sufficient power ($\beta = .8$) and a type I error probability of $\alpha = .1$. Assuming $\alpha = .05$ while keeping the same effect size and power, the number of observations increases to more than 260. The required number of observations drops if we use a categorical variable of revenue or number of customers as dependent variables.

[7]We generated a random number from a uniform distribution ranging from 0 to 1 for each participant. Participants with a number below 0.5 were assigned to the resource push group while participants with a number equal to or above 0.5 were assigned to the demand pull group. We conducted preliminary interviews before the program start to ensure no friendships or social ties linked participants from different groups.

Workshop		Demand pull group	Resource push group
Intervention	1	Ideation (*start from customer problem*)	Ideation (*start from key resources*)
	2	Business Model Canvas I (*customer segment & value proposition*)	Business Model Canvas I (*resources & value proposition*)
	3	Business Model Canvas II (*customer segment & value proposition*)	Business Model Canvas II (*resources & value proposition*)
	4	Mentoring session	Mentoring session
	5	Building an MVP (*focus on customers' early feedback*)	Building an MVP (*focus on testing different aspects of the business*)
Similar content	6	People Matters	People Matters
	7	Fireside Chat with CTOs	Fireside Chat with CTOs
	8	B2B Sales Secrets	B2B Sales Secrets
	9	Fireside Chat with Innovative SMEs	Fireside Chat with Innovative SMEs
	10	B2C Marketing Hacks	B2C Marketing Hacks
	11	Mentoring session	Mentoring session
	12	Storytelling	Storytelling
	13	Fireside Chat with Govt Agencies	Fireside Chat with Govt Agencies
	14	Powerful Online Presence	Powerful Online Presence
	15	Mentoring session	Mentoring session
	16	Fireside Chat with Unicorns	Fireside Chat with Unicorns
	17	Legal Essentials	Legal Essentials
	18	Fireside Chat with Exit Founders	Fireside Chat with Exit Founders
	19	Managing Startup Finances	Managing Startup Finances
	20	Fireside Chat with Angel Investors	Fireside Chat with Angel Investors
	21	The Winning Pitch	The Winning Pitch
	22	Fireside Chat with VCs	Fireside Chat with VCs
	23	What Investors Want	What Investors Want
	24	Pitch Competition & Grad Ceremony	Pitch Competition & Grad Ceremony

FIGURE 1 Program structure. The demand pull group serves as our treatment group while the resource push one acts as our control group. The two groups were exposed to the same content except for the first 5 workshops (the intervention phase). Differences between the groups are indicated in *italics*. We worked closely with instructors of the first 5 workshops to tailor the material provided to each group. To minimize any other differences between the two groups, each workshop was conducted by the same instructor throughout the program. Workshops were scheduled sequentially for the two groups, with one group starting first, followed by a short break, and then the other group. The program was conducted in two consecutive rounds in 2021 and 2022, with similar structures. In the second round, a few speakers were changed equally for both the treatment and control groups due to availability issues.

properly recognize and deploy their core resources and capabilities in their business. The individuation of such resources is thus critical and involves a process of self-discovery (Read et al., 2016). We asked participants to map their core values, competencies, and partners to identify VRIO resources (Mortensen, 2020). Identifying collaborators with valuable resources is extremely important in this process, as is extending the network of potential partners.[8] The value of the key resources identified was further validated through interviews with industry experts.

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[8]More information is available at www.effectuation.org.

3.2 | Business model

In workshops 2 and 3 we introduced the two groups to the business model[9] canvas, a visual tool for understanding the key aspects of a business (Osterwalder & Pigneur, 2010). The simultaneous visualization of all business blocks helps entrepreneurs discover potential inconsistencies. We used the same canvas for both groups but asked them to complete it following a different prioritization of activities. The demand-pull group was instructed to start from the right side of the canvas—customer segment—and develop the rest of the business model from there. All their choices had to be consistent with the *customer problem*, *solution*, and *persona* identified in the ideation workshop. In case of inconsistencies, the choices were iteratively adjusted to ensure all blocks aligned with problem and persona identification. In contrast, the resource push group started from the left side—key resources, partners, and activities—and developed the rest of the business model from there. All their choices had to be consistent with their key *resources* and *capabilities* identified in the ideation workshop. Figures A1 and A2 in Appendix A offer a visual representation of the canvas and the two opposite approaches. Figure A3 in Appendix A provides examples highlighting the differences between the two groups in the ideation and business model development phases.

3.3 | Minimum viable product

After a mentoring session in workshop 3, in workshop 4 the two groups were introduced to the MVP. An MVP is a prototype designed to test fundamental business assumptions before investing in the final product or service (Ries, 2011). The use of MVP is now common practice in accelerators and incubators as it brings empirical rigor to product development (Camuffo et al., 2020). Building on various practices in the field,[10] we differentiated our approach to MVP between the two groups. We instructed the demand-pull group to develop the MVP with the primary goal of collecting user interest in their solution before developing the fully-fledged product. We encouraged them to consider early feedback, including likes, website views, or sign-ups to refine their product. They also used MVP as an opportunity to collect additional customer information and improve their *persona-problem-solution* fit. Conversely, we instructed the resource push group to develop the MVP aiming to collect empirical evidence on their core business assumptions. These assumptions were defined by the entrepreneurs themselves and could be related to the value of their resources, fit with partners, or effectiveness of specific distribution channels. Examples from the program to contrast the two groups are presented in Figure A4, Appendix A.

Assignments and mentoring sessions. Besides the above workshops, we relied on assignments and mentoring sessions to reinforce our treatment and guide participants to adopt a certain approach. After the business model canvas workshops, we asked participants to share with us their canvas along with a detailed explanation of each block (Assignment 1). Similarly, following the MVP session, we asked participants to share their MVP and the main insights derived from it (Assignment 2). Our mentors provided feedback on the participants' assignments based

[9]A business model reflects how "the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit" (Abolfathi, et al., 2022; Teece, 2010).

[10]There is debate within the startup community on which assumptions to test with MVP and how to identify them (Leatherbee & Katila, 2020). Some advocate testing as many assumptions as possible, while others argue the core assumption to test is consumer interest in a yet-to-be developed product (Hall, 2019).

on their membership group (see Figures A5 and A6, Appendix A, for examples). The goal of such feedback was to encourage participants to follow the suggested training guidelines in launching their businesses.

4 | DATA AND EMPIRICS

4.1 | Data collection and measures

We collected information about our participants in three phases: enrollment, end of the intervention, and end of the program. We explain the variables obtained in each phase below.

Enrollment phase. We gathered generic information about participants and their business ideas. Demographic characteristics included the age of the main founder (*Age*), gender (*Female*), and ethnicity, with *Chinese* represented as a binary variable (1 if the founder was Chinese and 0 otherwise). *Education* was a categorical variable capturing the participant's highest level of education.[11] *STEM education* was a binary variable flagging a degree in Science, Engineering, or Computing, while *Business education* was another binary variable denoting a degree in business. Additional binary variables indicated whether participants were working (*Working*), studying (*Studying*), and had past entrepreneurship experience (*Entrepreneurship Experience*). The categorical variable *Work experience* reflected the participant's past work experience.[12] *STEM experience* was a binary variable indicating prior work experience in engineering or technology fields. *Team Size* indicates the total number of team members working on the idea. *Registered* as a binary variable equal to 1 if participants registered their venture prior to the program and 0 otherwise. Participants' business ideas were classified into four broad categories: *Commerce and e-Commerce*, *Online Platform and Apps, Services*, and *Others*.[13] The variable *Initial Revenue* accounted for the participant's estimated initial revenue (in SGD) and *Initial Customers* captured the initial customer base pre-program. To reduce skewness, we followed the approach of Kotha et al. (2022) and classified sales revenue and customers into a five-category Likert-type scale, *Initial Revenue(cat)* and *Initial Customers(cat)*.[14] *Second Round* was a binary variable set to 1 for entrepreneurs enrolled in the second round of the program and 0 for those in the first round. *Demand-Pull* was a binary variable equal to 1 if the participant was randomly assigned to the demand pull group (or treatment) and 0 otherwise.

End of the intervention. We collected additional information on participants' activities to conduct a manipulation check and assess their compliance with the intervention. We instructed six research assistants (three for each group) to run one-on-one interviews with the participants. The interviews were semi-structured, conducted via Zoom, and lasted about 30 min each. During the interviews, the research assistants asked open-ended questions about the key activities performed by the participants to advance their business ideas since the start of the program.

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[11]*Education* was equal to 1 in case of no tertiary education, 2 for Bachelor, 3 for Master, and 4 for PhD.

[12]*Work experience* was set to 0 in case of no prior work experience, 1 for work experience between 1 and 5 years, 2 for 10 years, 3 for 11–20 years, and 4 for above 20 years.

[13]The category *Others* involved business ideas that could not be classified in the previous categories as well as ideas that were too broad, vague, or unspecified by the participant in the enrolment phase.

[14]*Initial Revenue(cat)* was equal to 1 if sales were 0, 2 for sales between 1 and 1000 SGD, 3 for sales between 1001 and 5000 SGD, 4 for sales between 5001 and 10,000 SGD, and 5 for sales exceeding 10,000 SGD. *Initial Customers(cat)* was equal to 1 if the startup has 0 customers, 2 for 1–10 customers, 3 for 11–50 customers, 4 for 51–100 customers, and 5 for over 100 customers.

The research assistants were required to code the answers into four categories of activities: *Customer Interaction*, *Expert Interaction*, *Networking*, and *Others*. They also needed to assign an activity-related score ranging from 0 to 5 to each participant.[15] Importantly, the research assistants were completely unaware of the research scope and design, including the distinction between the demand-pull and resource push groups.[16]

End of the program. At the end of our 6-month program, we collected information about the performance of the participants' startups. This information was collected through interviews conducted by our research assistants and then supplemented with surveys.[17]

From the performance interviews and survey, we derived two main outcome measures. *Revenue* captured the total revenue (in SGD) generated by the startup since the start of the program, while *Customers* reflected the number of new customers acquired during the same period. These variables typically indicated the total startup revenue and customers since most participants started the program with zero. To reduce skewness, we classified these variables using the aforementioned five-category Likert-type scale, *Revenue(cat)* and *Customers(cat)*.[18] In addition, we defined an exit event for participants who did not respond to our final survey or interview, despite multiple reminders. Participants who voluntarily left the program due to personal reasons (e.g., starting a new career) were also considered exited. To capture all exit events, we created a binary variable called *Exit*. Finally, we constructed a binary variable *Program End* to indicate the data collected at the end of the program.

4.2 | Descriptive statistics

Table 1 presents the descriptive statistics for the *Demand-Pull* and *Resource Push* groups after randomization. Our participants are representative of *average* early-stage entrepreneurs in developed countries, resembling those in startup accelerators (Hallen et al., 2020) or entrepreneurship programs (Lyons & Zhang, 2018). A *t*-test analysis showed no meaningful differences between the two groups, confirming successful randomization.

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[15]*Customer Interaction* measured how much the entrepreneur engaged with customers and includes the activities of customer interviews, customer observation (ethnography), market research, and surveys. *Expert Interaction* measured the degree of engagement with experts in the participant's specific business sector. *Networking* captured how much the entrepreneur actively searched for potential partners, including team members, suppliers, or investors. The category *Others* comprised the remaining activities. The score 0 referred to no engagement with the activity while 5 referred to a strong focus on the activity.

[16]Classification and scoring of activities were considered intuitive and did not require any specific training. Before conducting the interviews, we had a joint meeting with our research assistants to instruct them on how to assign a score to activities. During the meeting, the research assistants also coordinated and discussed some scenarios to ensure consistent scoring practices. In addition, the research assistants were asked to jointly attend and audit each other's initial interviews to enhance the overall consistency in their scoring logic.

[17]One key limitation of our analysis is the reliance on self-reported performance measures. Only a small portion of the startups in our sample were listed on the Singaporean business registry, ACRA, and among them just a handful reported accurate financial information there. We implemented some safeguards to limit the noise associated with self-reported data and improve accuracy. In case of inconsistencies in the information reported, we organized follow-up interviews with the participant to clarify. We also adopted consistent criteria to handle ambiguous responses between the groups.

[18]We assigned *Revenue(cat)* a value of 1 if sales were 0, 2 for sales between 1 and 1000 SGD, 3 for sales between 1001 and 5000 SGD, 4 for sales between 5001 and 10,000 SGD, and 5 for sales exceeding 10,000 SGD. *Customers(cat)* received a value of 1 if there were no new customers, 2 for 1 – 10 new customers, 3 for 11–50 new customers, 4 for 51–100 new customers, and 5 for over 100 new customers.

TABLE 1 Descriptive statistics after randomization.

Variables	Demand pull		Resource push		Difference	
	Mean	SD	Mean	SD	Mean diff	*p*-value
Age	35.421	11.673	35.313	11.330	0.108	.942
Female	0.330	0.472	0.330	0.472	0.000	.998
Chinese	0.578	0.495	0.565	0.497	0.013	.837
Education	1.826	0.843	1.939	0.901	−0.112	.322
STEM education	0.396	0.491	0.304	0.462	0.092	.138
Business education	0.272	0.447	0.313	0.465	−0.040	.498
Working	0.644	0.480	0.643	0.481	0.001	.985
Studying	0.330	0.472	0.313	0.465	0.017	.774
Entrepreneurship experience	0.545	0.500	0.582	0.495	−0.037	.567
Work experience	2.000	1.408	1.930	1.342	0.069	.698
STEM experience	0.190	0.393	0.173	0.380	0.016	.748
Team size	2.132	2.045	2.263	2.576	−0.130	.665
Registered	0.264	0.442	0.278	0.450	−0.013	.812
Commerce and e-Commerce	0.280	0.451	0.269	0.445	0.011	.845
Online platform and App	0.214	0.412	0.191	0.395	0.023	.654
Services	0.413	0.494	0.382	0.488	0.030	.632
Others	0.090	0.288	0.156	0.364	−0.065	.126
Initial revenue(cat)	1.495	0.988	1.454	1.010	0.041	.756
Initial customers(cat)	1.469	0.819	1.418	0.860	0.051	.647
Second round	0.305	0.462	0.304	0.462	0.001	.980
Number of startups	121		115			

Note: A total of 9 participants did not disclose their initial revenue while 11 did not disclose information on customers.

Table 2 reports the descriptive statistics of the outcome variables for the two groups at the end of the intervention and the end of the program. Starting with the first set, it is interesting to compare, as a manipulation check, the key activities the two groups conducted in the initial weeks of the program. The *Demand Pull* group mainly engaged in the customer interaction activity while the *Resource Push* group paid relatively less attention to this task. However, the *Resource Push* group engaged more in networking activity in comparison to the other group. These results confirm the effectiveness of our intervention, suggesting the two groups followed a different set of activities and distinct priorities in starting their business. A formal manipulation check is provided in Appendix A, Table A1. The second set of variables in Table 2 reports the startup performance measures collected at the end of the program.

4.3 | Nonparametric analysis

Figure 2 visually compares the *Revenue(cat)* distribution of the *Demand Pull* and *Resource Push* groups at the end of the program and is drawn based on the estimated Kernel density

TABLE 2 Outcome variables.

Variables	Demand pull				Resource push			
	Mean	SD	Min	Max	Mean	SD	Min	Max
End of intervention								
Customer interaction	2.431	1.650	0	5	1.688	1.619	0	5
Expert interaction	1.931	1.599	0	5	2.011	1.517	0	5
Networking	1.529	1.369	0	5	1.877	1.420	0	5
Number of startups at the end of intervention	102				90			
End of program								
Revenue	4219	12,472	0	80,000	2566	8787	0	55,000
Revenue(cat)	1.843	1.365	1	5	1.595	1.120	1	5
Customers	39.475	84.701	0	500	17.5	53.411	0	300
Customers(cat)	2.17	1.438	1	5	1.63	1.095	1	5
Program end	0.5	0.5	0	1	0.5	0.5	0	1
Number of startups at the end of program	83				84			

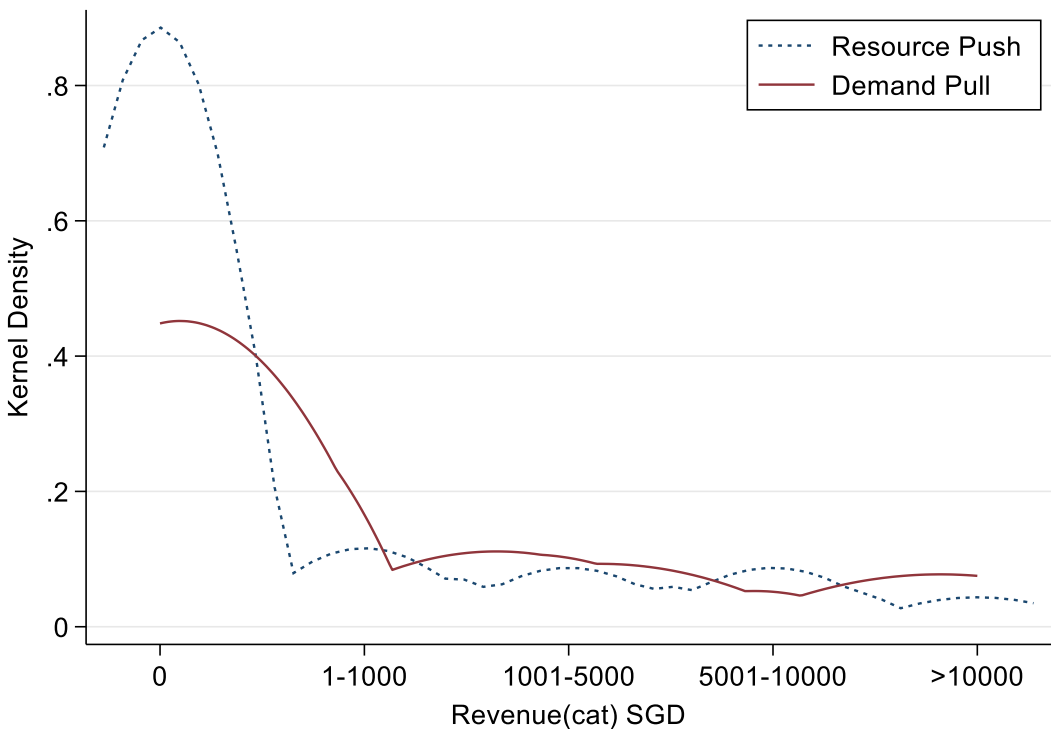kernel = epanechnikov, bandwidth = 0.2750

FIGURE 2 Entrepreneurs' revenue distribution at the end of the program.

TABLE 3 Intervention effect on startup revenue and customer base.

	(1)	**(2)**	**(3)**	**(4)**
Variables	Revenue	Revenue(cat)	Customers	Customers(cat)
Program end	499.702	0.036	7.107	0.107
	(589.275)	(0.109)	(5.141)	(0.110)
	[0.397]	[0.743]	[0.168]	[0.330]
Program End × Demand Pull	2264.093	0.374	26.990	0.625
	(1196.709)	(0.191)	(10.585)	(0.191)
	[0.060]	[0.052]	[0.011]	[0.001]
Constant	1675.508	1.485	7.616	1.460
	(252.838)	(0.040)	(2.233)	(0.040)
	[0.000]	[0.000]	[0.001]	[0.000]
Observations	394	394	391	391
Fixed effects	Yes	Yes	Yes	Yes
R-squared	0.062	0.053	0.117	0.153
Number of startups	227	227	225	225

Note: Robust standard errors are in parentheses. *p*-values are in brackets. *Demand Pull* coefficient is missing due to the presence of fixed effects. A total of 9 participants did not report any initial or final revenue and 11 participants did not report any initial or final customer numbers for their startups, thus in all cases these are treated as missing startups.

distribution for each group. The figure reveals that the *Revenue(cat)* distribution of the *Demand Pull* group is shifted to the right, indicating superior performance. Notably, the *Demand Pull* group had a lower share of startups with zero revenues and a higher share of startups with positive revenue. These findings suggest the beneficial effect of the demand pull training affected mostly the early-stage entrepreneurs who started the program with zero or very low revenues and customers. A sizable fraction of these entrepreneurs compared to the resource push group was able to generate initial traction for their business. We observe a similar pattern in the *Customers(cat)* distribution reported in Appendix A, Figure A7.

4.4 | Regression results

Table 3 reports the regression model testing the effect of *Demand-Pull* on the generated revenue and customers acquired by participants' startups. We adopted a difference-in-differences estimation strategy comparing the revenue generated by startups before and after the program (Kotha et al., 2022). We controlled for entrepreneur-fixed effects and applied clustered standard errors by venture. Model 1 reports the effect of demand-pull training on absolute revenue. The results show that the *Demand Pull* group on average generated about 2300 SGD more in revenue than the other group ($p = .060$). Model 2 repeats the analysis using the categorical variable *Revenue (cat)* as the dependent variable. The findings suggest that *Demand Pull* group achieved a 0.37-point increase in revenue ($p = .052$) compared to the *Resource Push* group. Model 3 replicates the analysis using the absolute number of new customers as a dependent variable, while Model 4 uses *Customers(cat)*. The results show that at the end of the program, the *Resource Push* startups acquired on average 7 new customers, while the *Demand Pull* startups acquired over

26 ($p = .011$). Based on Model 4, this effect is quantifiable as a 0.62-point increase ($p = .001$). Overall, our results are stronger and more meaningful when the dependent variable used is the number of acquired customers rather than revenue given the high variance in the latter variable.

In the Online Appendix, we provide several robustness tests. First, we rule out alternative explanations by showing that the performance difference between the two groups is not driven by heterogeneous (1) exit rates or (2) time efforts. We then replicate our analysis (3) including exited ventures and (4) focusing on participants with at least 80% attendance. We also report a (5) mediation analysis and (6) separate results for each program round.

4.5 | Qualitative evidence

The interviews conducted with participants revealed two valuable insights into *why* demand pull training is more effective for early-stage startups compared to resource push training.[19] First, demand pull training facilities cost-effective learning by teaching entrepreneurs valuable skills such as customer interaction, empathy, active listening, and observation. This helps them gain a better understanding of the essential features of their product without the immediate need to build it. Conversely, the resource push group often made the mistake of adding unnecessary features to their product just because they had the capability to do so.[20]

Second, demand-pull training promotes the undertaking of crucial activities that are typically overlooked or neglected by entrepreneurs. The interviews revealed that participants found it more challenging to interact with potential customers compared to engaging with their personal network or reflecting on their available resources. This is understandable as reaching out to strangers requires stepping outside one's comfort zone. Notably, demand-pull entrepreneurs proactively engaged with their network and reflected on available resources, even though these activities were not actively encouraged by the program. In contrast, very few resource-push entrepreneurs spontaneously chose to interact with potential customers. This highlights the effectiveness of demand-pull training in promoting behavior change and encouraging activities that entrepreneurs may find challenging or outside their comfort zone.

5 | CONTRIBUTIONS AND CONCLUSIONS

We conducted a field experiment inside an entrepreneurship program to closely examine the efficacy of two different training approaches, demand pull and resource push. Our research aimed to understand which approach is more successful in supporting early-stage entrepreneurs in acquiring initial customers and generating startup revenue. We find that the demand-pull approach outperforms the resource-push approach in achieving these outcomes.

Our paper makes two main contributions to research on strategy and entrepreneurship. First, we add to the debate on the recognition of entrepreneurial opportunities (Casson, 2005; Shane & Venkataraman, 2000) and resource mobilization (Clough et al., 2019) by empirically examining the impact of different startup launch approaches on nascent entrepreneurs' performance. By adopting a process perspective, we demonstrate how the prioritization and

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[19]The entrepreneurial journey of some selected participants is reported in Appendix A, Figures A3 and A4.
[20]For an example, see David's case in Figure A3, Appendix A.

sequencing of activities in the pre-entry stage substantially influence startup performance. It is worth acknowledging that our findings do *not* suggest that demand-side considerations are universally more important than resource-side considerations for entrepreneurial success. Similarly, we do acknowledge the role of entrepreneurial resources in shaping startup performance. Yet, our training does not affect the resource endowment of participants, as it remains relatively stable during the program. Our results highlight how a demand-pull approach *adds more value* by encouraging nascent entrepreneurs to prioritize certain activities, such as customer interviews and feedback collection, which are often neglected in the early stages. An interesting avenue for future research could involve delving into the psychological and social challenges that make interacting with potential customers difficult for entrepreneurs. Possible explanations may include a preference for local search within immediate social networks (Clough et al., 2019), limited social skills, or a lack of interpersonal communication abilities (Dimitriadis & Koning, 2022), particularly among entrepreneurs with specialized technological education (Graham, 2005). Exploring this area further would provide insights into the underlying dynamics of entrepreneur-customer interactions and the development of soft skills in entrepreneurial training.

Second, we extend the emerging work on identifying the most effective interventions for early-stage startups (Bhatia & Levina, 2020; Chatterji et al., 2019; Gonzalez-Uribe & Leatherbee, 2018; Hallen et al., 2020). In line with recent empirical findings, our results highlight the disproportionate importance of acquiring skills related to customer and market analysis (Anderson et al., 2018), as well as collecting feedback from customers (Camuffo et al., 2020), during the early stages of the startup journey. These skills are particularly critical for early-stage entrepreneurs in driving startup performance. On the other hand, we speculate that demand-pull training may be less impactful for late-stage entrepreneurs who already have an established customer base. As ventures progress from the launch stage to the growth stage, the ability to identify and leverage strategic business resources, such as personal networks, becomes more prominent (Kotha et al., 2022; Nai et al., 2021). Further exploration of this dynamic would offer insights into the evolution of entrepreneurial strategies and interventions across different stages of venture development.

We acknowledge several limitations that should be considered when interpreting the findings. The economic impact of our results is relatively small as they pertain to very early-stage organizations. The net present value of our program is positive only if the estimated effect is indicative of persistent revenue growth. This assumption is supported by research suggesting that initial traction is the best predictor of long-term venture success (Gimmon & Levie, 2021) but remains speculative. To assess the long-term effects, a longer observation period would be required, allowing for the examination of factors such as the effect of customer feedback on startup exit rates (as observed in Camuffo et al., 2020). It is also worth remarking that the effects reported in our analysis relate to the *average* ideapreneur and thus are hardly predictive of outliers. A customer-focused approach may improve the average performance but can hardly produce radical innovations (Felin et al., 2020). Entrepreneurs with extraordinary resources or breakthrough ideas may still succeed regardless of the training approach received. Furthermore, our study should be considered exploratory in nature. Replication studies with larger sample sizes, sub-group analysis, and more objective measures of performance are necessary to provide normative guidance.

ACKNOWLEDGMENTS

CONFLICT OF INTEREST STATEMENT
The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT
The data supporting the findings of this study are available in Open Science Framework (OSF) at https://osf.io/7dx8n/. Publicly posted data do not contain information that would allow individuals to be identified without consent.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

APPENDIX A

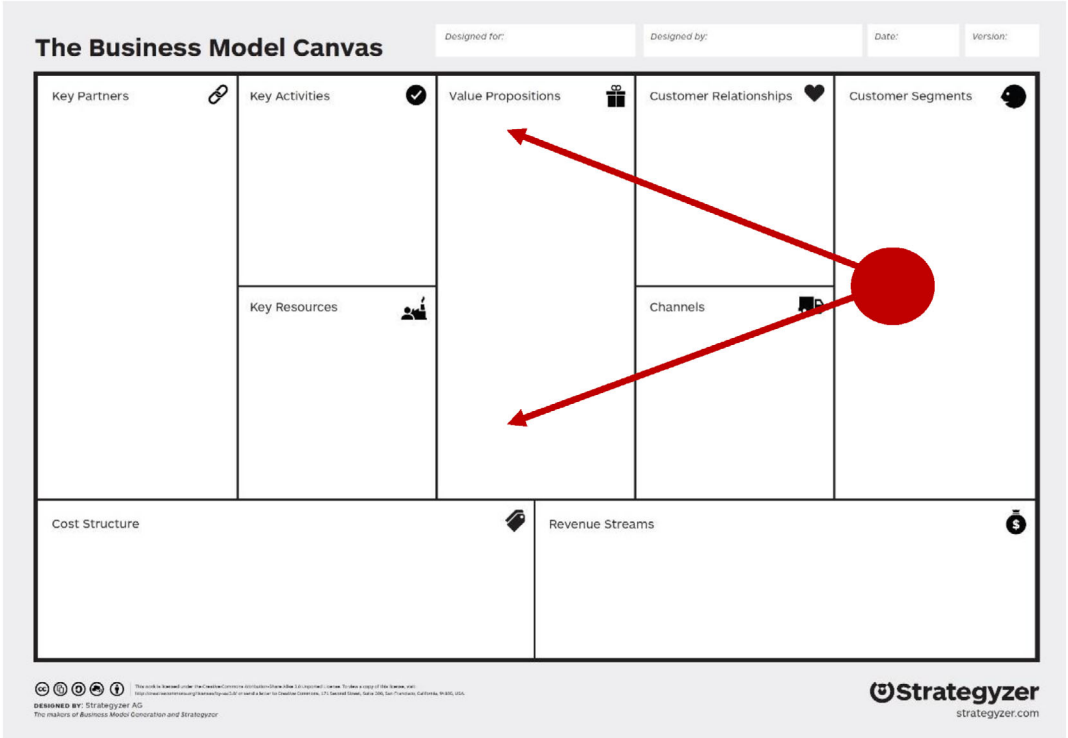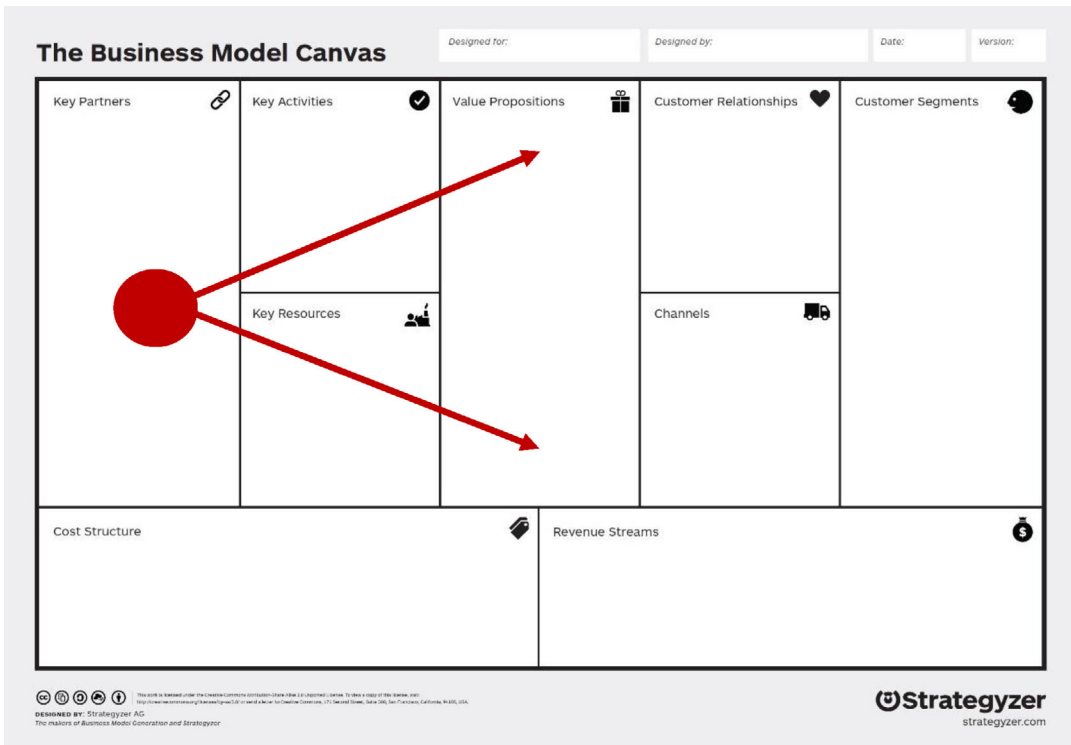## A.1 | ADDITIONAL MATERIAL AND EXAMPLES FROM THE PROGRAM

FIGURE A1 Business model canvas for the demand pull group. Our canvas is an adapted version of the business model canvas available at www.strategyzer.com. The business model canvas is reproduced under the Creative Commons license.

FIGURE A2 Business model canvas for the resource push group. Our canvas is an adapted version of the business model canvas available at www.strategyzer.com. The business model canvas is reproduced under the Creative Commons license. (strategyzer.uservoice.com/knowledgebase/articles/506842-can-i-use-the-business-model-canvas-or-value-propo).

Demand pull participants:

Ryan was an ideapreneur interested in developing an online platform to help people collect information about, find, and buy plants in Singapore. Before building the platform, he interacted with several potential customers to gain insight into their *pain points* with existing solutions and develop a better idea of his *ideal persona*. He learned several useful details that were subsequently embodied in the design of his final product. He understood that his ideal customers should be property owners as they are more likely to make investments in plants than people living in rented apartments such as expatriates. He realized that many individuals have a latent love for plants but do not know where to start. Ryan's platform was thus designed as a one-stop solution for customers' most pressing questions: How to start? What to buy? Where to buy? How to take care? What works for my budget?

Adeline was an ideapreneur interested in developing customized wedding dresses. She designed a few bespoke dresses for some friends and wanted to create a business out of it. Similar to Ryan, she engaged with several potential customers to better understand their *pain points* with existing solutions, honing her understanding of her *ideal persona*. She understood that individuals with body size concerns were the best customers for her business. They often encountered difficulties with traditional services but held a deep desire to look perfect on their wedding day. She also learned that the option to return a dress, try on pre-existing designs, and better dress visualization were key issues to address in designing the business model.

Resource push participants:

David is an illustrative example from the resource push group. Building on his extensive *knowledge* and *background* in the financial industry, he developed an online platform to help entrepreneurs make more accurate evaluations of their startups. According to him, most entrepreneurs do this job poorly and require help from an expert. Later in the development process, he added additional services such as cash-flow forecasting and risk analysis, his main areas of expertise, to the platform. He did *not* engage in any customer interviews but instead relied on his knowledge and past corporate experience.

Kate is another good example from this group. Her entrepreneurial aspiration was to create a clothing brand with a "new aesthetic based upon marrying masculinity and structure with the fluid female form." The goal of this brand was to empower women by incorporating strong, almost masculine silhouettes, while still allowing the innate femininity of the wearer to shine through the clothes. The business idea was a direct reflection of the founder's *values*.

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*Participant names have been changed to preserve anonymity.

FIGURE A3 Examples from the program on the ideation/business model development phase.

Demand pull participants:

Jasmine was one of the most successful demand pull entrepreneurs. She started with the idea of offering a booking system for small gyms that has social features. After conducting several surveys and interviews with potential customers as well as developing a prototype aimed at testing user engagement—a website with no back-end designed purposely to observe customer behavior on the platform—she discarded the social features as unnecessary. She later refocused the value proposition of her platform on flexibility and usability, two features that were highly appreciated by customers during the prototype stage.

Yaza is another successful demand pull participant. He identified a major problem affecting sports amateurs in his home country, Myanmar. Most large, international sport clothing resellers, such as stockX, do not ship to Myanmar due to the difficult political situation. Counterfeiting is widespread and e-commerce websites are often unreliable. Yaza thus created a simple website to sell limited-edition sneakers to Burmese customers online. The website emphasized order traceability and guaranteed authenticity as key value propositions, two critical pain points he discovered through multiple interviews. The MVP was well received and the ideapreneur was able to arrange his first transaction of 170 Singapore dollars.

Resource push participants:

John, a participant from the resource push group followed a different approach. He was an ideapreneur who launched an e-commerce website selling bicycle parts. In the MVP process, he mostly focused on testing assumptions related to the logistics of his business and his relationship with suppliers. His initial idea was to sell bicycle frames but, after collecting some data, changed to bicycle parts as they are easier to acquire and distribute. John did not interact with potential customers until the very end of his entrepreneurial journey.

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*Participant names have been changed to preserve anonymity.

FIGURE A4 Examples from the program on the minimum viable product development phase.

Subject: Assignment 1 Feedback

Dear [Entreprenuer's Name],

Glad to hear you started working hard on your business idea and completed the assignment. A few suggestions on the next steps:

You identified very interesting pain points related to "buying toys for kids". The next step is to think about your website features based on the most relevant customer pain points. How to understand what are the most relevant pain points? Please conduct additional interviews and try to rank problems based on what people are telling you. Once you have an idea about the ranking of the different problems (validated by the interviews), you can start developing the features of your website based on that. As anticipated before, different problems require different features.

In the next classes, we are going to provide you with additional suggestions and useful material.

Best regards,

[Mentor's Name]

FIGURE A5 Feedback email example to a demand pull participant.

Subject: Assignment 1 Feedback

Dear [Entreprenuer's Name],

Thanks for submitting the first assignment of our program. Glad to see you have started working hard during the past weeks and completed the assignment.

Overall, we believe you are on the right track! Your key resources, including your physical and intellectual resources as well as industry connections, are great assets that you can leverage in launching your business. As a next step, you may consider thinking about what resources make you unique and put you in a better position in the market in comparison to the competitors. For example, it can be a specific formula or access to certain raw materials that few competitors can obtain. We are looking forward to seeing how your business evolves during the program.

In the next classes, we are going to provide you with additional suggestions and useful material.

Best regards,

[Mentor's Name]

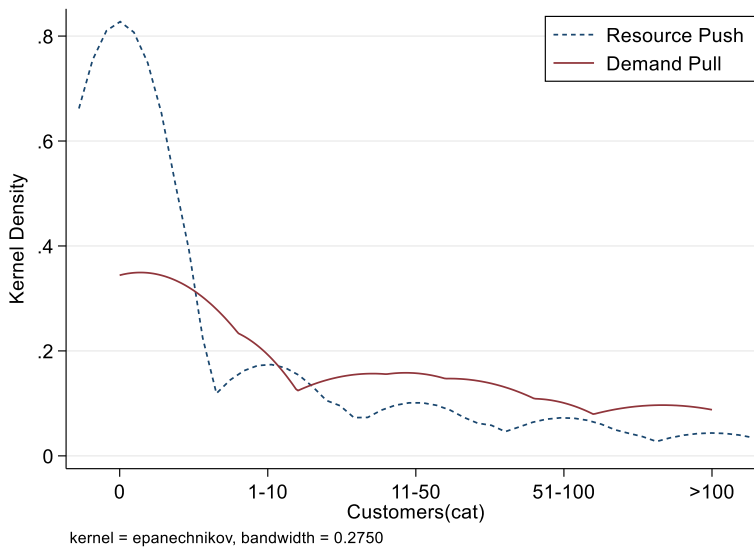**FIGURE A6** Feedback email example to a resource push participant.

kernel = epanechnikov, bandwidth = 0.2750

FIGURE A7 Kernel density of entrepreneurs' new customer distribution at the end of the program.

TABLE A1 Manipulation check (end of intervention).

	(1)	(2)	(3)
Variables	Customer Interaction	Expert Interaction	Networking
Demand Pull	0.742	−0.080	−0.348
	(0.236)	(0.225)	(0.202)
	[0.002]	[0.724]	[0.086]
Constant	1.689	2.011	1.878
	(0.171)	(0.160)	(0.150)
	[0.000]	[0.000]	[0.000]
Number of startups	192	192	192
R-squared	0.049	0.001	0.015

Note: Robust standard errors are in parentheses. *p*-values are in brackets. Constant refers to the *Resource Push* group.