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Hāth se Sīkhna: Geographies of Practical Learning and India's Agricultural Skills Agenda

A significant challenge of skill development in the global South is providing meaningful opportunities for practical learning. While previous studies have explored this as a pedagogical challenge, in this paper, I take a geographical perspective, arguing the barriers to practical learning extend beyond pedagogy and often relate to socio-economic conditions. I draw on a study of a new agricultural skill development scheme in the states of Punjab and Himachal Pradesh in north India. Trainees enrolled in the scheme expressed strong desires for opportunities to 'learn by hand' (*hāth se sīkhna*), which training rarely provided and which were often availed in informal settings. The extent to which trainees found useful practical learning opportunities varied based on gender, caste, and locality. Drawing on theories of communities of practice, I argue that desired practical learning was marred not only by the inability or unwillingness of trainers to provide practical classes, but also by regionally specific factors, such as administrative constraints, local agrarian structure, and regional patriarchies. This suggests that coordinating effective forms of practical learning requires regional-level strategies that are attentive to social and economic context.

Keywords: practical learning; vocational pedagogies; skill development; communities of practice; agricultural skills; India.

Introduction

Educationists have long recognised that skill acquisition requires opportunities for practical learning. In contrast to theoretical learning – which relates to the acquisition of relatively abstracted and decontextualised knowledge – practical learning relates to the acquisition of 'know how': a capacity to engage reflexively in personally and socially valued embodied performances in accordance with the demands of specific situations (Billett, 2009; Dreyfus & Dreyfus, 2014; Eraut, 2004). Depending on the skills in question and the needs of the learner, this may entail combinations of 'hands-on' learning, roleplay, repetition of tasks under a mentor's supervision, work placements, and apprenticeships (Lucas et al., 2012). Ideally, when one learns practically, there are opportunities for reflection in which one may bridge the gap between theoretical knowledge and practical demands (Eraut, 2004; Fuller & Unwin, 2003; Jjuuko et al., 2021). Opportunities for such learning may occur both in sites of formal training and in informal spaces amongst 'communities of practice' (Lave & Wenger, 1991; Mills & Kraftl, 2014).

Yet, it is also widely recognised that in formal vocational training settings, practical learning – or, 'vocational pedagogy' – is neglected. Both policymakers and trainers tend to emphasise funding, curricula, qualifications frameworks, and institutional reform before vocational pedagogies are considered (Lucas, 2016). This deficiency is even more apparent in the global South. In India, notwithstanding Gandhi's exhortations on the value of 'learning by doing,' academic education has been overvalued at the expense of modalities of learning associated with vocational skills (Singh, 2001). Research on India's vocational education system has found that vocational teachers often lack a clear conception of the value of practical classes (Pilz, 2018). Work placements – which are regarded as especially important in providing trainees opportunities to develop skills *in situ* – are rare and those that do exist are often poorly coordinated and exploitative (Ruthven, 2018).

This paper seeks to understand the challenges of practical learning in the global South through a geographical lens. It aims to identify both pedagogical and socio-spatial factors that enable or inhibit effective practical learning opportunities. It does this through reference to a study of a set of new agricultural training programs in the states of Punjab and Himachal Pradesh, India. One of the starkest findings of the study was that enrolled trainees wanted more opportunities to 'learn by hand' (*hāth se sīkhna*), believing theoretical lectures were of limited value in imparting skills. Initially, these complaints seemed to indicate a pedagogical problem – that trainers lacked awareness of effective methods of practical instruction. Deeper analysis revealed, however, that the dearth of practical learning opportunities was more attributable to a series of geographically contingent factors. Trainees in Punjab and Himachal had substantially different experiences of practical learning – differences which could be explained in terms of factors like the structure of the agrarian economy, prevailing gender norms, and administrative constraints on trainers. I argue that – particularly in the informal sector – formal skill development requires access to spaces of informal learning in what Lave and Wenger (1991) call 'communities of practice.' Policymakers must consider the regionally specific nature of these communities of practice and devise regional strategies to overcome barriers of access, to improve systems of social learning, and increase synergies between formal and informal learning.

Geographies of Practical Learning and Communities of Practice

Practical provisioning is typically considered a pedagogical challenge: trainers need knowledge, skills, and willingness to implement effective practical classes. Such thinking is evident in the emphasis on 'training of trainers' programmes in skill development policy across the global South, which seek to upgrade trainers' skills in vocational pedagogy (Ajithkumar, 2016). However, critical studies of education (notably, Billett, 2009; Eraut, 2004) and social sciences research on skills suggests this perspective is somewhat simplistic and requires a more place-based perspective. Meaningful, sustained, and effective opportunities for practical learning hinge on a multi-scalar convergence of actors, interests, incentives, relationships, institutions, and materials, the achievement of which is beyond the capacity of individual training providers (Streeck, 2011; Patchett, 2017; Gough et al., 2019). Such convergences are contingent and fragile, coming together and falling apart with changes in historical circumstances (Gowlland, 2012; Gough et al., 2019). Recognising its contingency, it becomes imperative to probe the conditions under which effective and empowering forms of practical learning are possible (Avis, 2004).

Appropriate pedagogical methods are undoubtedly important in providing opportunities to consolidate skills, but so too are various other factors. These include relational, power-inflected aspects of the training site and the affordances they provide for participation in a diverse array of tasks (Fuller et al., 2004; Billet, 2004). Training sites marked by encouraging relations of trust and respect, for example, may encourage learners to feel comfortable to experiment with new skills (Mills & Kraftl, 2014; Chea & Huijsmans, 2017). Meanwhile, trainers themselves need time, resources, social networks, and a facilitative regulatory environment to organise enriching practical classes – including linkages to industry. These factors are conditioned by the broader

economic and political environment, including dominant state-capital-labour relations and prevailing institutional structures. For example, the provision of effective on-the-job training and apprenticeships – highly important modalities of practical learning that allow learners to acquire skills *in situ* – hinges on institutional mechanisms to allay employers' fears that trainees might be 'poached' by competitors (Streeck, 1989, 2011).

In the global South, such mechanisms are rarely in place. Employers may be reluctant to provide work placements or apprenticeships due to resource constraints and governments' inability to allay poaching concerns (Amegah, 2021). Documented work placements in the global South have been found to lack coordination, with trainees receiving inadequate preparation and supervision to ensure that work experiences effectively bridge the barrier between theory and practice (Jjuuko et al., 2021; Ruthven, 2018). Moreover, economies in the global South are marked by informal and small-scale enterprises (Munck, 2013), which lack the means to provide formal apprenticeships. Those training for work in the informal sector largely aspire to self-employment and hence work placements within larger enterprises may have little relevance in preparing them for their future work conditions. Practical learning is necessary for informal enterprise, as much of the knowledge on which it rests is tacit, place-specific, and develops through relations of trust with fellow practitioners in applied settings – hence nigh-impossible to impart through theoretical classes alone (see Goyal & Heine, 2021). But this practical learning is less likely to occur in formal apprenticeships than the localised community, family, and cultural settings in which *informal learning* takes place.

Practical learning within informal settings can be well-conceptualised in terms of Lave and Wenger's (1991) theory of situated learning. Lave and Wenger argue that such learning takes place in the context of 'legitimate peripheral participation' within 'communities of practice.' Learning occurs as people seek to become part of the diverse communities of practitioners that make up society – which may consist of schools, workplaces, neighbourhood associations, friendship groups, or various other formal and informal social formations within which organized activity takes place. They posit that learners begin by observing and participating in relatively low-skilled and less important tasks within communities of practice and gradually shift towards fuller forms of participation and more advanced tasks. This is understood as a social process: newcomers learn by observing, working alongside, and receiving guidance from more established practitioners – but also, as Fuller and Unwin (2003) demonstrate, from fellow newcomers. Through such immersion, learners not only acquire knowledge and skills, but also come to identify as skilled practitioners within the community and develop a sense of belonging. Since mastery of skills is part of the process of gaining acceptance, recognition, and belonging within communities of practice, situated learning also creates social incentive structures that motivate learners to persist in skill acquisition. Anthropological studies of artisanal apprenticeships have reinforced this, showing how the acquisition of skills occurs in-tandem with the assumption and performance of personally meaningful gendered, ethnic, and religious identities (Marchand, 2008; Simpson, 2006).

Yet, not all communities of practice are the same: their structure and properties determine whether they provide meaningful opportunities for participation, learning, identity formation,

motivation, and belonging. Lave and Wenger (1991) note that overly hierarchical communities of practice often lead to distorted learning outcomes, as newcomers learn more about resisting authority than about targeted skills. Likewise, highly didactic and non-participatory instruction does not inspire active feelings of involvement, which undermines learning. Fuller and Unwin (2003) expand on this, identifying great variation between workplaces in the extent to which they offer opportunities for learners to acquire a broad array of transferrable skills and hence develop more multi-faceted, expansive professional identities. Subsequent research has shown that policymakers may play a role in facilitating communities of practice that are more conducive to learning and belonging. For example, Gowlland (2012) shows how the Chinese government's collectivisation of craft industries in the 1950s led to a shift from traditional master-apprentice relations to a model of participatory learning in larger groups of apprentices in classroom settings. This led to more open dissemination of skills and knowledge formerly held as 'trade secrets' – and to a richer form of sociality which craftspeople found enjoyable and motivating.

Research also shows that differentiations within and between communities of practice may influence opportunities for learning and skill acquisition. Studies of workplace learning have challenged Lave and Wenger's (1991) tendency to assume communities of practice lead to the development of singular practitioner-based identities. They note that learners bring diverse identities into the workplace based on prior social position and experience and develop differentiated identities when working in the same community of practice based on their specific experiences of workplace learning (Fuller & Unwin, 2003; Eraut, 2004). These differentiated experiences and identities can be more or less conducive to learning. In some cases, diverse identities lead to richer forms of knowledge-sharing between differently positioned practitioners (Fuller et al., 2004; Fuller & Unwin, 2003). In other cases, they are sources of counterproductive divisions. The shared values that develop between members of communities of practice can lead to exclusionary boundary-making, whereby community members see themselves as fundamentally different from other, related communities and hence unwilling to share knowledge and experience across the divide (Ingram et al., 2014). Worse still, communities of practice may be marred by internal divisions – as when a group, otherwise marked by a shared identity as practitioners, must compete for resources (Probst & Borzillo, 2008; Duguid, 2005) or are divided along lines of social identity, such as ethnicity (Kaba, this volume). Such competitive environments erode not only practitioners' willingness to share information and skills, but also the group's internal cohesion (Britt, 2020).

These concerns about competition and division undermining the efficacy of communities of practice is relevant to the present study of agricultural skill acquisition. Previous research suggests farmers are more likely to engage in social learning, disperse skills, and collectively innovate where they are organised in communities of practice marked by trust and friendship (Tran et al., 2018; Dolinska & d'Aquino, 2016). Involvement in such communities has been found to enhance farmers' motivation to master agricultural skills – and being connected to fellow farmers has been shown to reduce drop-out rates from agricultural training programs (Azumah et al., 2022). Yet, this depends on farmers believing they share interests and common purpose, which may vary across time and according to context (Morgan, 2011). Similar conclusions could be drawn for much of the informal sector: meaningful cooperation and social

learning between the largely self-employed actors that make up the informal sector depend on relations of trust, solidarity, and contingent convergences of interests that are highly place-specific (Goyal & Heine, 2021; Kaba, this volume). Therefore, to tap existing communities of practice as a basis for advancing practical learning, policymakers require a regionally specific understanding of how those communities are organised. In what follows, I explore how local contextual factors impinge upon communities of practice in ways that lead to specific regional geographies of practical learning and skill acquisition.

Context and Research Methods

The research that informs this paper was conducted between October 2018 and May 2020. It focused on a set of agricultural training programs that were introduced as part of the Government of India's skills reform agenda (see King, 2012). The rollout of these agricultural trainings has been overseen by the Agriculture Skill Council of India (ASCI), formed in 2013. ASCI has developed more than 170 'qualifications packs,' each covering material related to one specific agricultural job role (such as 'wheat cultivator', 'dairy entrepreneur', or 'tractor operator'). Qualifications packs outline skills to be imparted through modular trainings of 150 to 300 hours' duration. They have also developed model curricula, most of which recommend around half of training hours be devoted to practical classes. Although the content and structure of ASCI's qualification packs and model curricula vary, most have a focus on the scientific and technical aspects of agricultural production, strategies to increase yield, the use of equipment and technology, safe practices, and entrepreneurship skills.

To implement training, ASCI partnered with providers with experience in agricultural education. Though these providers are diverse, at the time of research, most trainings were being imparted by publicly-funded extension service providers – specifically agricultural universities and district-based agricultural extension agencies known as Krishi Vigyan Kendras (KVKs).

Research took place at seven training centres in Punjab and Himachal Pradesh, including KVKs, agricultural universities, and one undergraduate college. The two states chosen, though geographically adjacent, differ in agrarian structure. Punjab has a long history of commercial, capital-intensive agriculture, while Himachal Pradesh is a mountainous state, where farming is small-scale, and often practised alongside non-agricultural wage labour and non-farm entrepreneurial activities. The two states also differ in the gendered relations of agricultural production: in Punjab, women are removed from agricultural activities as a marker of status, whereas Himachali women perform most day-to-day agricultural tasks.

The ASCI training programmes observed were for job roles related to organic farming, dairy entrepreneurship, small-scale poultry, mushroom cultivation, and beekeeping. These training programs were selected as they were popular trainings in the North Indian setting, and because they reflected some of the diversity of agricultural training programs being implemented at the time.

Data collection entailed interviews and direct observation. When possible, my research assistant and I observed both theoretical lectures and practical classes – including attending several field trips. We were attentive to both the content of classes and pedagogical techniques and strategies, including how trainers adapted content to local conditions, responded to trainee questions, and structured practical classes, and how trainees engaged with theoretical and practical content.

Interviews with trainers and trainees were semi-structured, allowing a focus on key issues relevant to the study and scope for interviewees to elaborate and provide insights that may not have been anticipated in advance. 20 interviews were with the trainers and administrators of ASCI-affiliated training providers. These interviews focused on their views on the ASCI scheme, their approach to implementation – including the value they placed on practical classes and how they structured them – and challenges they faced regarding the scheme. An initial 82 interviews were conducted with trainees – 29 in Punjab and 53 in Himachal. All interviewees (trainers and trainees) were recruited at the training site of selected training programs. Participants were informed about the nature and objectives of the study and uses of the information they would provide and gave verbal consent to participate in the study.[1] An effort was made to recruit all enrolled trainees who were willing to participate – though time did not always allow this. We also attempted to ensure the sample was representative of the gender composition of enrolled trainees. Interviews focused on trainees' reasons for enrolling, their experience and evaluation of the training, and their plans after completion. Interviewees were 77 per cent male and 23 per cent female; the age range was 19 to 69 with a median age of 33.6 years. Their caste backgrounds were broadly reflective of the caste composition of their regions, with general (high) castes being slightly over-represented. Almost all were from landowning families and planned to use the skills gained through training in self-employment or family-based employment; none wished to work as agricultural labourers, except one, who planned to do so after migrating abroad.

The first interviews took place in late 2018 and early 2019. In late 2019 and early 2020, follow-up interviews were conducted with 51 of the initial 82 trainees, exploring the impacts training had on their lives and livelihoods. While the first round of interviews were mostly conducted at training sites, the second round were mostly conducted with trainees at their farms and villages, which created opportunities for more ethnographic modes of engagement, in which I developed a deeper appreciation of the social contexts of skill acquisition. The second round of interviews had a substantive focus on practical learning. Trainees were asked in greater depth about their preferred methods of practical instruction and their views on how practicals were conducted during their training. Follow-up interviews with some of the initial trainers were also undertaken. Drawing on research suggesting work-integrated learning provides some of the most effective opportunities for skill acquisition (e.g. Fuller & Unwin, 2003) both trainers and trainees' thoughts on alternative approaches to practical classes were elicited, including possibilities for work placement models, as well as possible barriers to effective practical provisioning. Recognising the situated, social, and often informal character of much practical learning, as outlined by Lave and Wenger (1991), questions were also asked about how skills were acquired in contexts outside formal training – including in community and family settings and with formal organisations other than the training provider. The semi-structured nature of the interviews allowed trainees space to elaborate on aspects of their practical learning that were particularly

meaningful to them, including those that fostered the sense of identity and belonging that Lave and Wenger (1991) describe. In analysing the findings, consideration was given to differences between trainees in their experiences with practical learning along the lines of gender, caste, age, locality, and class-position.

In what follows, I outline the findings of the study in relation to practical learning. I begin by outlining the forms of practical learning observed in the ASCI programs, some of their shortcomings, and how trainees evaluated them. I then show how many trainees nonetheless found opportunities for practical learning – but that this was often outside training, within communities of practice. I then detail the gender, caste, and regional inequalities and differences between trainees in their access to communities of practice and the empowering effects of participation within them. Finally, I explore how even within the same region, there could be differences between communities of practice based on the activity in question and its social organisation – showing specifically how beekeepers tended to form dynamic communities of practice, even in localities where this was not the norm.

Practical Learning in Agricultural Training and its Limitations

Most trainers welcomed ASCI's provocation to deliver a large share of training via practical modalities. They saw practical classes as essential to consolidating skills, noting 'farmers learn practically' and 'are not interested in theoretical or classroom training programs.' Yet, in practice, the 'practicals' offered were limited and comprised only a small proportion of training hours (though there were substantial variations between training providers in the extent of practicals offered). The practical classes that were offered were rarely participatory. Work placements were not observed at any point in the research.

What were termed 'practicals' took one of two forms. The first were field visits. For most training programs observed, 2 to 3 days were dedicated to off-site learning, typically at large commercial ventures. Trainees typically did not have opportunities to participate in work at these sites and the commercial ventures were often operating on a scale beyond trainees' material capabilities. The second kind of 'practical' were class-based demonstrations – for example, of the preparation of organic inputs and composting as part of organic farming training. The demonstrations observed typically only involved the active participation of a small number of trainees, if any. More commonly, trainers performed the demonstration while trainees observed. These demonstrations were not *in situ*: they occurred in the artificial environment of the training site, which may have differed to that encountered on trainees' farms.

Although not designated as 'practicals,' some lectures observed were closely organised around practical themes. Some lectures began with a brief explanation of scientific principles of practice but then moved on to explore in interactive ways the practical challenges trainees would face. For example, during one mushroom cultivation lecture, the trainer took considerable time to ask trainees about the materials available in their localities that could be used for composting and the kind of spaces they had for cultivation, advising how they could make best use of their resources. She facilitated collective discussions about trainees' plans and talked through potential problems

they might encounter and how they might address them. Trainees with prior experience in mushroom cultivation were encouraged to share their stories, which other trainees found motivating. Such approaches to delivering lectures – which worked on trainees' imaginations regarding their concrete circumstances and material constraints – were common.

During interviews, trainees were asked if anything about the training could be improved. The most frequent response was that training was overly theoretical and would have benefitted from more frequent and better-quality practicals. Several indicated they were not accustomed to sitting in lecture theatres taking notes – particularly those with low levels of prior education – and that theory didn't 'stick in the brain' ('*dimāg me lagāna*'). Several noted the practical classes on offer were insufficiently participatory, such as Harshika,[2] a 32-year-old female trainee:

> For making compost, they showed us how it is made, but it was already made there, we did not make it... It would have been beneficial to learn by doing.

While there was some variation in trainees' expressed preferences for types of practical classes, most, like Harshika, wanted more hands-on learning experiences. This was particularly true of trainees with limited prior experience in agriculture – which amounted to 35 of the 82 trainees interviewed – as well as those coming back to agriculture after a hiatus or those seeking to master new technical skills. For example, a group of experienced dairy farmers who were enrolled in a dairy entrepreneurship training complained that what trainers called 'practicals' were mostly field visits, which one of them described as 'visual demonstrations of theory.' They wanted more opportunities to learn by hand ('*hāth se sīkhna*'), specifically in relation to administering vaccines to animals. One trainee suggested it would have been beneficial if they could administer vaccines under the supervision of the trainer, and receive feedback on their technique. Several others expressed similar wishes, noting that only after having hands-on experience would they develop the confidence to start a new venture or use a new technique. Trainees' demand was not for work placements – that was rarely considered a possibility – but rather for more hands-on field visits and on-site demonstrations.

In the second round of interviews with trainers, I mentioned trainees' complaints about deficient practical classes. In most cases, trainers were interested in administering better practical classes – some were actively seeking opportunities to do so – but they faced several barriers, including inadequate facilities for on-site demonstrations and administrative hurdles. Some staff also noted time constraints – administering ASCI trainings being only one of their various professional responsibilities. I discussed with trainers whether they might consider job placements as part of training. This was acknowledged as a good idea, but extremely difficult to implement, given the challenges of finding appropriate local enterprises that could host a sufficient number of trainees to be a viable arrangement.

Practical Learning outside of Training

Given constrained possibilities for on-site practicals, trainers emphasised the importance of off-site skill development over a more extended period. Skills, they argued, are not consolidated in

classroom settings in a single month – they are acquired when farmers attempt to apply what they had learnt in their fields, make mistakes or encounter challenges, and return to their trainers with follow-up questions. They imagined a loosely structured community of practice, consisting of farmers and trainers, within which skills are developed with a more extended and open temporal horizon. In their view, excellent practical classes were less important than trainees developing a relationship with trainers, such that they could reach out to them to receive feedback when things went awry.

In some ways, this accorded with trainees' vernacular understandings of what practical learning entails. Several trainees saw the loss experienced because of mistakes as the most powerful prompts for adjustments in techniques and upgrading of skills. Malini, a female trainee, had no experience of agriculture prior to her marriage. When she first attempted to use a sickle, she badly injured her hand. Gesturing to the resultant scar, she laughed and exclaimed: 'This is practical!' Several other trainees related how prior mistakes ultimately became their greatest teachers, making lessons learnt in training more tangible. Lakshman, a trainee who was transitioning to organic farming, explained how he, despite intellectually grasping the principles of organic pest management in class, could not fully appreciate them until he encountered a significant pest-related loss. He explains how this consolidated his learning:

> [These principles] can be taught, but even if you teach me, I will not listen to it. When I take a loss, then I will believe it.

After experiencing loss, Lakshman returned to his trainer for additional advice, thereby improving his understanding.

Trainees were aware that practical experience unfolded over extended periods and in response to unpredictable events that could not always be incorporated into training. One beekeeping trainee noted that his practical experience had come at unpredictable increments – when weather and bee behaviour allows – requiring a temporal flexibility that did not conform to the more regimented schedules of training (see Philips, 2020). They thus saw value in an ongoing mentoring relationship with trainers, rather than learning everything during training.

Yet, the communities of practice that supported trainees' ongoing practical learning consisted not only of their former trainers, but included several other actors within their networks. Some reported learning practical skills from more experienced family members, as continuations of the legitimate peripheral participation that typically began in childhood. Yet, family often has a hierarchical, patriarchal, and gerontocratic organisation within which women and younger men are denied opportunities to make use of skills in empowering ways: their skills are subordinate to the needs of the family.[3] Some female trainees who had acquired skills to start their own agricultural ventures were unable to experiment with them after training, as their parents-in-law considered them of limited value. Young men, too, could be discouraged by their families from further developing agricultural skills, claiming they ought to be pursuing more remunerative non-agricultural employment. Furthermore, families often lack access to the broader knowledge present within a networked community – a concern also noted in studies of traditional craft apprenticeships, where skills are hoarded as 'trade secrets' (Gowlland, 2012). One young trainee

complained, ‘in the village… they only know how to farm like their elders did’ – he wanted the benefits of scientific knowledge and more open dialogue on different approaches.

One of the most profound unintended benefits of training was that it could serve as a space for networking, which constellated communities of practice. Several trainees noted that the primary benefit they took from training was meeting other trainees, which provided a milieu in which practical learning and problem solving could take place, even after training. Becoming linked to a community of aspiring innovative farmers bolstered trainees’ sense of identity in relation to their livelihoods. This was especially important for young men, whose families and communities had discouraged agriculture – lower caste men in particular. Arjun, for example, came from a lower caste family, which associated agriculture with poverty and the indignities of rural caste oppression. He noted the greatest benefit of training for him was meeting fellow trainees ‘who were very literate and skilled,’ which created a more positive image of farming, enhanced his identity as a farmer, and motivated him to develop skills further. In some cases, trainees would visit each other’s farms after training was over, providing informal opportunities for practical learning and sharing innovations. More common was for trainees to form WhatsApp groups, which provided an online platform for practical problem-solving. When trainees encountered problems, they would post queries to the group and solve them together or with the help of trainers (who were typically also members of the WhatsApp group). When they had success, they posted pictures to the group, serving both as models to follow and a source of further motivation. This highlights the role of social media in fostering connection, motivation, and active learning (Azumah et al., 2022).

Some trainees were also connected to external communities of practice that proved beneficial. Connecting with self-help groups (SHGs), non-government organisations (NGOs), government departments, or the local veterinary doctor, was an important way to connect with other practitioners and safely experiment with new technologies and techniques. Connecting to such groups, again, fostered experience-sharing, collective problem-solving, and the formation of empowering identities as rural innovators. Group membership could also help trainees access subsidised inputs – which allowed them to experiment and become familiar with new materials and equipment without needing to make a personal investment. Some trainees also consolidated skills after training by connecting with experienced practitioners, who could serve as informal mentors. Training could be a catalyst for connecting with these more extended communities of practice; or, for those with pre-existing connections, training could be just one part of a social learning process that pre-dated training.

Regional, Gender, and Caste-based Differences in Practical Learning Opportunities

Informal learning within communities of practice thus proved critical in consolidating practical skills; yet, there were notable differences between trainees in the extent to which they had access to such communities and the benefits they conferred. There were very substantial regional differences, with social relations between villagers in Himachal being more conducive to situated learning than in Punjab.

Himachal has several ongoing traditions of collective labour (Fischer, 2017), which provide both a platform for working alongside others, but also a set of social norms around sharing capabilities. Trainees from Himachal said it was common practice to share resources such as seed and facilities, which was how many people learnt about new crops and techniques. Moreover, the relative precarity of agricultural livelihoods in the state predisposed farmers towards imitating others' success. 'People watch and they try things which they think are profitable,' one farmer explained. This observational learning was possible since relatively small landholdings and the absence of the high fences around animal enclosures that are typical in Punjab mean that when one farms or tends to animals, they are often in the copresence of other villagers who might comment on one's work, giving feedback – useful or otherwise. When one observes someone doing something innovative, they might say '*yah kya kartoot?*' ['what is this you're doing?' or, literally, 'what handicraft is this?'] and there is some social expectation that one should share their knowledge and skills with anyone who asks. For example, Abhinav, a 22-year-old man, came to poultry training after having experimented – along with his family – with several other agricultural ventures, with varying success. After poultry proved profitable, he felt indebted to share what he'd learnt with others in his village, visiting their chicken coops and giving advice on storage of feed and cleanliness.

> If anyone has a problem now, they call me. I help them. It feels good to share. Earlier I used to ask around. Now that I have this knowledge, I share it with others.

Almost all trainees in Himachal similarly told of how they shared what they learnt in training with others in their village. Abhinav's disposition towards sharing his skills was intensified by his mother's long-term involvement in a local NGO focused on livelihood development. In Himachal, people were more extensively networked within NGOs, self-help groups, civil society organisations, and government departments than in Punjab and were more inclined to trust them. Women were often highly active in these groups and could play important roles in distributing new skills within them.

Not all trainees in Himachal thought this disposition towards sharing to be positive. Some resented the expectation that they give their knowledge away, while others spoke of bandwagon effects, where misguided practices spread as quickly as well-informed ones. Nonetheless, the expectation that new knowledge and skills should be shared provided a platform for *in situ* learning with fellow practitioners.

In Punjab, by contrast, most trainees were reluctant to share skills and knowledge with other farmers in their locality. It was more common for trainees in Punjab to say they would not share what they had learnt with others (without payment) and most did not believe that other experienced practitioners in their village (outside of their family and kin networks) could be consulted for detailed advice. Much of this can be explained in terms of agrarian structure. Punjab has a long history of commercial agriculture, which was intensified by the Green Revolution of the 1960s and 1970s. Some suggest this led to a breakdown of social solidarity within Punjabi villages, as farmers came to regard each other as competitors (Shiva, 1991). One dairy trainee explained how he was aware of an elder in the village who had developed a successful approach to collecting and selling milk; but he could not ask him for advice directly

(much less work alongside him as an apprentice) and could only observe from afar. As he explained:

> No one teaches anything. It will be a threat to their livelihood. If there's competition in the village then their profits will decrease. His customers will be divided.

Further, the development of capitalist agriculture in Punjab has resulted in greater class segmentation, with clear distinctions between (a) labour-employing farmers, (b) farmers who work their own lands, and (c) agricultural labourers who work on the farms of others (Byres, 1981). These class distinctions carry social status. To work on the farm of another – even simply to gain practical knowledge and experience – would be associated with the (mostly lower caste) agricultural labourer community and connote low status. Trainees in Punjab were often perplexed by the suggestion of gaining practical learning experience through a work placement on another's farm – more so than in Himachal. As one trainee explained:

> Most of the farmers have their own land, so they don't want to work [for someone else]. They want to employ someone for his or her dairy farm and they don't want to work under someone.

Others noted the poor pay and frequent mistreatment of agricultural labourers when explaining why work placements were unworkable:

> [M]ost of the low-level labourers, they have low salaries and they are not treated well... If you are already working there, you can; but, if your father is a rich guy, why would you? You will not put up with that shit.

Established commercial farmers expressed reluctance to host trainees for work placements, noting inconvenience and doubting trainees would work hard. One was concerned apprentices would 'steal' skills and start their own competing ventures. Such concerns are frequently observed in studies of informal apprenticeships (Regel & Pilz, 2019; Kaba, this volume).

It also became apparent that some young men in Punjab did not like the idea of asking for advice from an experienced practitioner as a matter of pride. It was important for them to demonstrate they were capable making it on their own, which corresponded to regionally specific constructions of masculinity, which emphasise independence (Chowdhry, 2015). One 30-year-old man in Punjab explained why he had never asked anyone for help in his agricultural work, despite encountering numerous setbacks:

> With the knowledge I have, I want to do it myself. If I feel like there are some issues with me then I will try to take more training.

Those with large commercial ventures found the suggestion that they should ask anyone for advice ridiculous – believing that no one in their vicinity knew how to farm better than them.

Dispositions towards participation in communities of practice – and thereby reap the benefits of situated, practical learning – thus varied regionally, largely as a function of prevailing class structure, and regionally-specific masculinities. Yet, even within the same region, there were variations in participation in communities of practice, particularly based on gender and caste. Stigmas around women's participation in agricultural work meant that there were no women

enrolled in any ASCI programs studied in Punjab. In Himachal, women were more disposed towards sharing with each other using WhatsApp groups, in civil society collectives and in everyday interactions than were men. They were, however, hesitant about working on the farm of another person, which would be associated with low-status – especially concerning for high-caste women. Women's domestic duties also meant that they were concerned they would lack time for longer-term practicals – such as work placements – and their lack of decision-making power within the patriarchal household created further hesitancy. 'It all depends on the family' one female trainee explained. This aligns with the findings of previous studies, which suggest Indian women's capacity to participate actively in training is often curtailed by familial expectations (Ramasamy & Pilz, 2020; Brown 2020).

Connecting to experts and experienced practitioners for practical learning required networks, tending to benefit trainees with higher stocks of social capital – typically older, higher-caste men. While some reported acquiring skills from friends and kin, it is noteworthy that both kin and friendship relations tend to fall along caste lines, leading to the hoarding of resources and skills within (mostly privileged) caste communities (see Chari, 2004). Whatever organic communities of practice exist thus tend to be fragmented along gender and caste lines, limiting the potential for situated learning.

Activity-Based Differences in Opportunities for Practical Learning

Even in the competitive environment of Punjab, there was an exception to the tendency to hoard skills within families: beekeepers. Beekeepers tended to form more cooperative communities of practice that actively enhanced skills. The work itself demanded more social relations of skilling, for two reasons. First, beekeeping skills are technical and scarce: they cannot be readily acquired from family. They are also difficult to grasp through theory alone, and potentially dangerous: making it risky to attempt as a solo project. Second, the division of labour in beekeeping typically could not be handled within the family. The reasons for this were, again, geographically specific. In Punjab, agroclimatic conditions are not conducive to making a profitable livelihood as a sedentary beekeeper: hives must be migrated seasonally to access pollen, often across vast distances. Patriarchal norms specific to rural North India restrict the mobility of most women, as well as restricting public forms of physical labour, which has the effect of rendering beekeeping a masculinized activity. Within most households, there is insufficient surplus male labour to coordinate the migration and monitoring of hives, which creates significant incentives to collaborate with other beekeepers.

When beekeepers were able to find partners with whom to collaborate, their effects on learning were transformative and tended to conform to patterns of legitimate peripheral participation (Lave and Wenger, 1991). Newcomers would pair with established beekeepers – typically a friend or distant relative. They would purchase or construct a small number of hives, which they would keep together with the established beekeeper. The two would work together, providing the newcomer opportunities for observational and supervised hands-on learning and an on-hand source in advice. The established beekeeper would benefit from the newcomer's labour,

particularly when transporting hives, harvesting honey, and marketing. For this reason, beekeepers exhibited little hesitation in sharing knowledge and skills, as one commercial beekeeper explained:

> Why would I hesitate? I get the benefit; I make money from it. If there are more people [working with me], then I have to hire less labour.

The formation of these communities of practice and the practical learning opportunities they provided were thus contingent on a set of incentives for cooperation that were not as evident in other agricultural activities in Punjab.

Cooperation tended to endure because, while working together, bonds of friendship and trust were consolidated that made cooperation enjoyable. Their collective labour was often accompanied by socialising, drinking, and laughter. This gave newcomers the motivation to persist in starting their beekeeping businesses despite only marginal returns in the early stages. As Dyson (2010) observed elsewhere, within friendship groups one may become motivated to emulate skilled peers (who become role models), while affective bonds between friends motivate those with experience to share their knowledge. These social incentives were highly important in sustaining communities of practice.

The social relations of learning also created a foundation for more long-term economic cooperation which helped ensure beekeepers' financial success – such as developing more advanced business models and increasing their geographical spread. This provided newcomers opportunities to graduate towards fuller participation. The bonds of friendship and solidarity that formed, could also help overcome social barriers to success. For example, some noted resistance from fellow villagers to beekeeping ventures, based on a (somewhat misguided) perception that it would put others at risk of bee stings. In this slightly hostile social milieu, having a community of friends committed to the activity could strengthen aspiring beekeepers' resolve. Recognising these benefits of social connections, several highly experienced beekeepers continued to attend formal training programs not so much to acquire more advanced knowledge, as to meet other beekeepers with whom they could discuss opportunities to work and learn together, share advice on good locations to keep hives, and plan how to address structural issues, such as the dominance of honey traders. The fact that beekeepers were organised within communities of practice transformed training to a more dynamic and productive site, where informal networking structured opportunities for practical learning and economic cooperation.

There were, however, limits to the way these communities of practice functioned as a basis for situated learning. The implicit trade involved when beekeepers take on newcomers as informal apprentices – pooling labour in exchange for teaching – began to make less sense when the novice exceeded a certain scale. Gurpreet, an established beekeeper, indicated that he would only take on newcomers as apprentices if they owned less than ten beehives. Beyond that, the benefits of pooling labour would begin to tip in the newcomer's favour. He also indicated that he might see someone with a large number of hives as a potential competitor and not someone he should assist with learning.

There was also evidence that beekeeping communities of practice could be socially exclusionary. As these communities of practice formed along lines of kin and friendship, they also, almost by default, occurred along lines of caste. Members of castes with no prior involvement in beekeeping found it challenging to find an entry point into communities of practice. For example, one beekeeping trainee from a low caste, Manjit, enrolled to learn beekeeping as an out from his current low-paid job as a petrol pump operator. Despite attending training diligently for a month, he did not gain access to a community of more advanced practitioners: no one offered him opportunities to work together. He thus started a small beekeeping venture with an even less experienced friend – and their lack of prior experience led their bee colonies to quickly collapse.

These findings suggest a sobering point: even communities of practice that function in empowering ways may exhibit exclusion criteria that have nothing to do with skill or one's willingness to learn or embrace an identity as a practitioner. These exclusions relate to pre-existing identities that structure the social field (see Kaba, this volume). They may not be consciously enforced exclusions, but come as consequences of the gendered division of labour (which resulted in women's exclusion from beekeeping communities of practice) or the unequal distribution of social capital (which resulted in the exclusion of lower caste members).

Conclusion

The findings of this study reiterate the value of a place-sensitive perspective on skill acquisition and practical learning (see Eraut, 2004; Gough et al., 2019; Mills & Kraftl, 2014; Patchett, 2017). The challenges of providing effective practical learning opportunities are not only pedagogical, but relate to the affordances of the local environment (Billett, 2004) and the broader political economy (Streeck, 2011). In the present study, trainers needed adequate facilities, administrative support, time, and industry connections to make effective practical classes a reality, while trainees needed a supportive social milieu to partake in informal social learning.

As documented elsewhere in the global South (e.g. Amegah, 2021; Juuko et al., 2021), in the present study possibilities for on-site practicals were limited by resource constraints, while work placement opportunities were curtailed by a dearth of appropriate rural enterprises and a reluctance of some trainees to participate. As such, the most meaningful opportunities for practical learning often occurred outside of training in more loosely organised communities of practice – much as described by Lave and Wenger (1991). Although much of the learning within these communities was informal, it was not entirely separated from formal training programs – trainers continued to serve as mentors within these communities, to greater or lesser degrees – suggesting possible strategies to synergise formal and informal learning. Communities of practice were activated in ways that helped consolidate skills when trainees (a) attempted to apply what they learnt in training and approached mentors for assistance when they encountered challenges; (b) maintained dialogue amongst each other – often through online platforms; (c) become part of support groups; and (d) worked alongside others within their localities and sought input from experienced practitioners. In some cases, the social connections developed through

these modalities of skill development helped consolidate trainees' identities as practitioners and enhanced motivation, much as Lave and Wenger (1991) suggest.

Yet, the findings also reiterate a point raised by critics of Lave and Wenger, namely that learners bring diverse identities to communities of practice – not only their identities as aspiring practitioners (Fuller & Unwin, 2004; Eraut, 2004). Gender and caste identities could encourage or inhibit trainees from seeking learning opportunities or working together cooperatively. Moreover, a range of socio-spatial conditions affected whether trainees had access to communities of practice and how effective these communities were in encouraging skill development. Economic competition could inhibit willingness to share knowledge and skills, while social status concerns made some trainees reluctant to work under an experienced practitioner or ask them for guidance – as was evident in the marked differences in dispositions towards social learning observed in Punjab and Himachal. The willingness of Punjabi beekeepers to engage in cooperative, social learning suggests this is more to do with prevailing economic incentives to cooperation than intrinsic 'cultural traits.' Patriarchal constraints could limit women's capabilities to engage in practical learning – both within training and outside – while differences in social capital could limit some individuals' and groups' access to communities of practice – of particular concern in India, where enabling social contacts are often concentrated amongst relatively privileged castes (Chari, 2004). This aligns with the findings of previous research that has identified how hierarchies and divisions within and between communities of practice create barriers to situated learning (Gowlland, 2012; Ingram et al., 2014; Probst & Borzillo, 2008).

The regional variations between communities of practice identified here, suggest that developing strategies to enhance practical learning within skill development schemes will need to be regionally specific, and attentive to regionally salient inequalities (Wedekind et al., 2021). This is particularly true for skills in the informal sector, which rely on place-specific learning within communities of practice to a greater extent (Goyal & Heine, 2021). Such strategies could be developed by initiating dialogue with existing communities of practice (such as civil society groups or economic cooperatives) about preferred models of curriculum and pedagogy (as suggested by Ramasamy & Pilz, 2020; Wedekind et al., 2021), while seeking to overcome constraints on the formation of equitable and empowering communities of practice in other domains. Geographers and allied social scientists could play significant roles in informing such strategies, which would take skill development from the rarefied domain of national-level policy-making, into the more tangible local realms where the benefits of training stand to be realised.

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Notes

[1] The ethics protocol was approved by the Human Research Ethics Committee of the University of Melbourne (ID number 1851028.1).

[2] All names used to refer to research participants are pseudonyms.

[3] As Pilz and Wilmshöfer (2015) observed elsewhere in India, elders within family tend to delegate unskilled tasks to younger family members, without providing opportunities to participate in more advanced tasks, curtailing the progression from ‘peripheral’ to ‘full participation.’