Developing soil science skills in the community: standardising observations for biodiversity monitoring
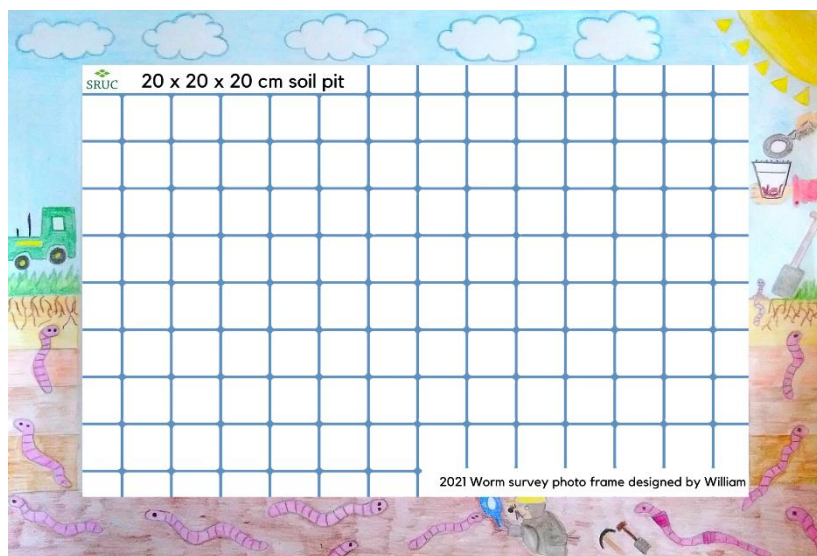
Summary

The photo frame was designed through the colouring competition (winning design by William). It was discovered that there is no interest in personalisation/customisation/DIY elements. Instead ease of use is essential to design decisions. The fabric prototype reviews have been very positive. The paper vs fabric photo frame choice experiment resulted in 0 vs 100 % use for earthworm photography. Quality images have been submitted for 83 % participant results to date:

	Previous surveys		**2021 survey**	
Method	*Paper template*	*No template*	**Fabric template vs paper template**	
Results with verification photo	*6 %*	*0 %*	**83 %**	**0 %**

Development

The concept of a photo template developed through discussions about making a metal or fabric version which would

be durable compared to printing paper sheets to take into the field.

The assumption was that people would be inspired by different themes e.g. soil life, monochrome or soil art, and having the choice in template would influence engagement. However, all entries to the competition were the 'soil life' category. The winning design was made by William (acknowledged on the template with parental permission) (Figure 1). The template has a colourful border (colour correction), the size of the soil pit (observation size) and gridlines for scale.
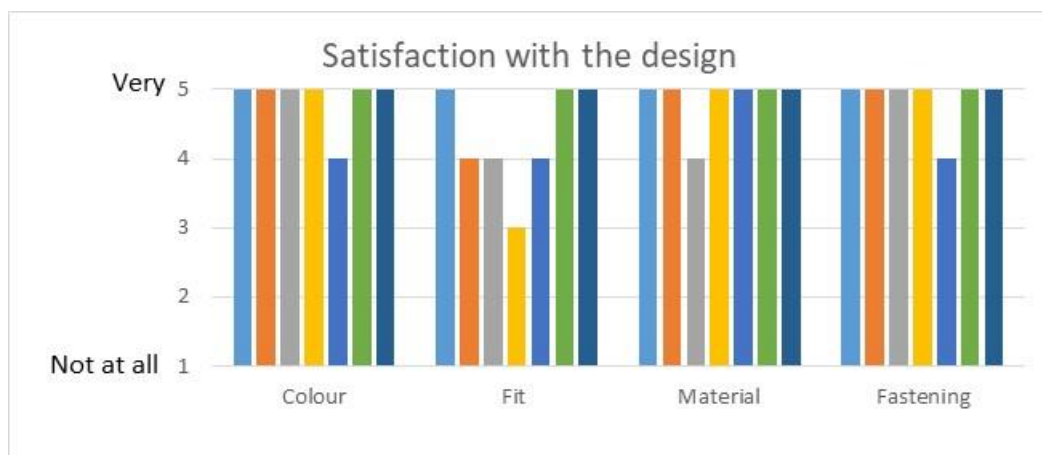
Figure 1: Winning design

The fabric prototype was produced – it wraps around a fork or spade, secured by a stainless steel popper (Figure 2). This means it is available for use at any time – rather than planning, printing and laminating the paper template.

Figure 2: Prototype attaches to the sampling fork so is available for use at any time. The attachment is two stainless steel poppers.

The prototype was posted to volunteers from farmers and agronomists for feedback about the design. An anonymous google form was used to provide formal feedback (Figure 3).

Feedback

We thought it could do with being slightly bigger e.g. A4 size
For the QR code design below it would be useful to have links to some basic worm info for beginners, and links to ID aids for more intermediate users.
It's a cool design to attach to a fork as it saves you carrying it. It's so nice, we didn't want to get it dirty - but we might dare and then see if it washes clean. Can I wash it?
I loved the worm mat and its illustrations
I like the concept, thought the material was good for keeping worms in place and providing a easy, clear backdrop in-field. Would it be possible to have ecological group ID information included anywhere? This would be incredibly useful in the field.

Figure 3a: Good satisfaction scores and written feedback about the prototype
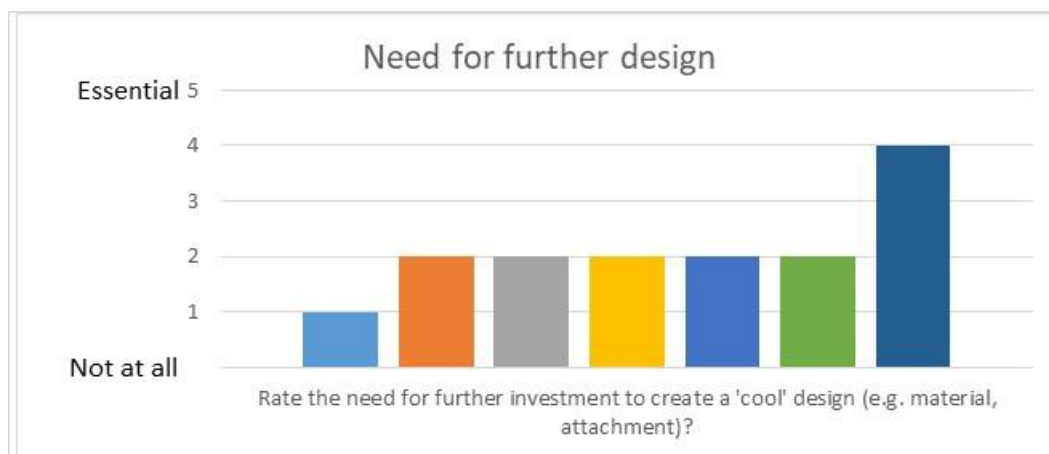

Figure 3b: 86 % reviewers did not consider any further investment in aesthetics was needed
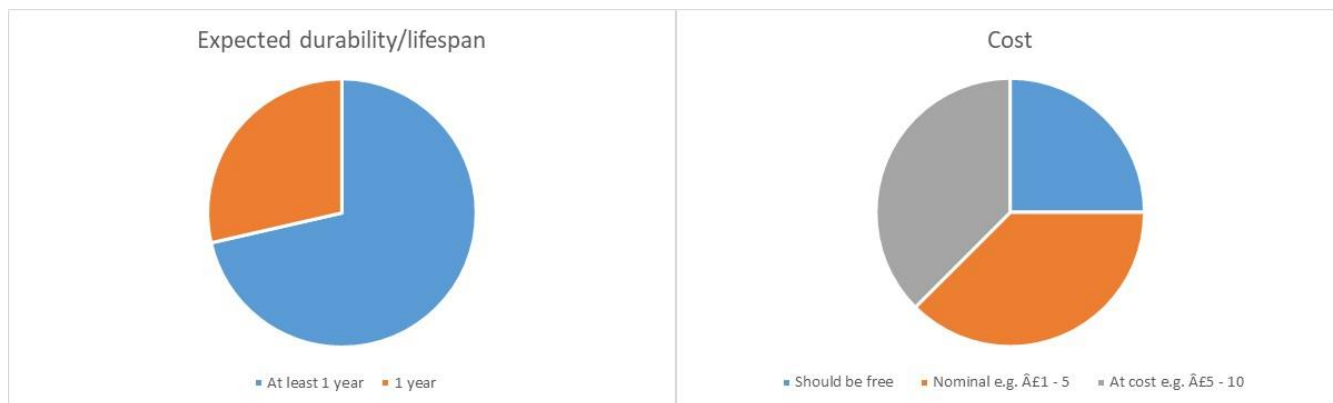
Figure 3c Best durability/lifespan of the fabric wrap was long-term, noting nobody selected 'one-time use' or 'months' in lifespan categories. Figure 3d opinions on cost, noting nobody selected 'for profit' e.g. £10+
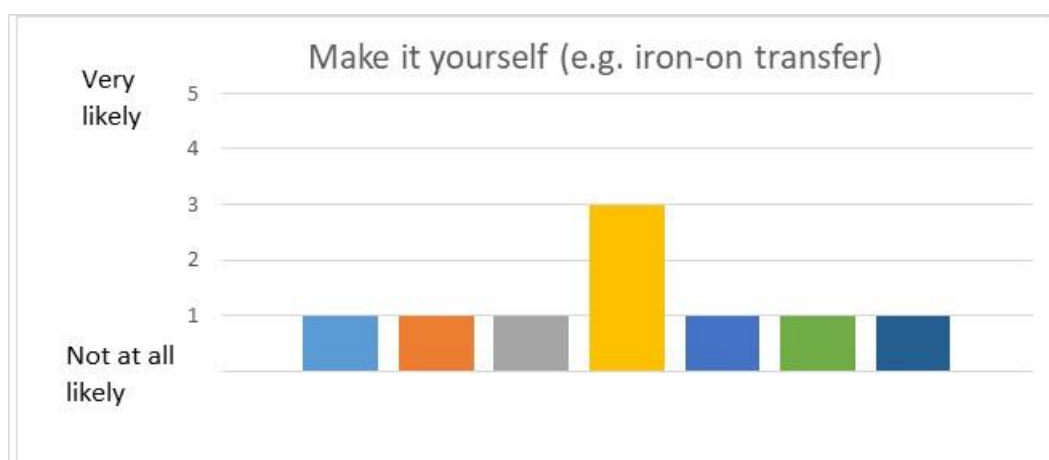

Figure 3e: People were not interested in do-it-yourself designs.
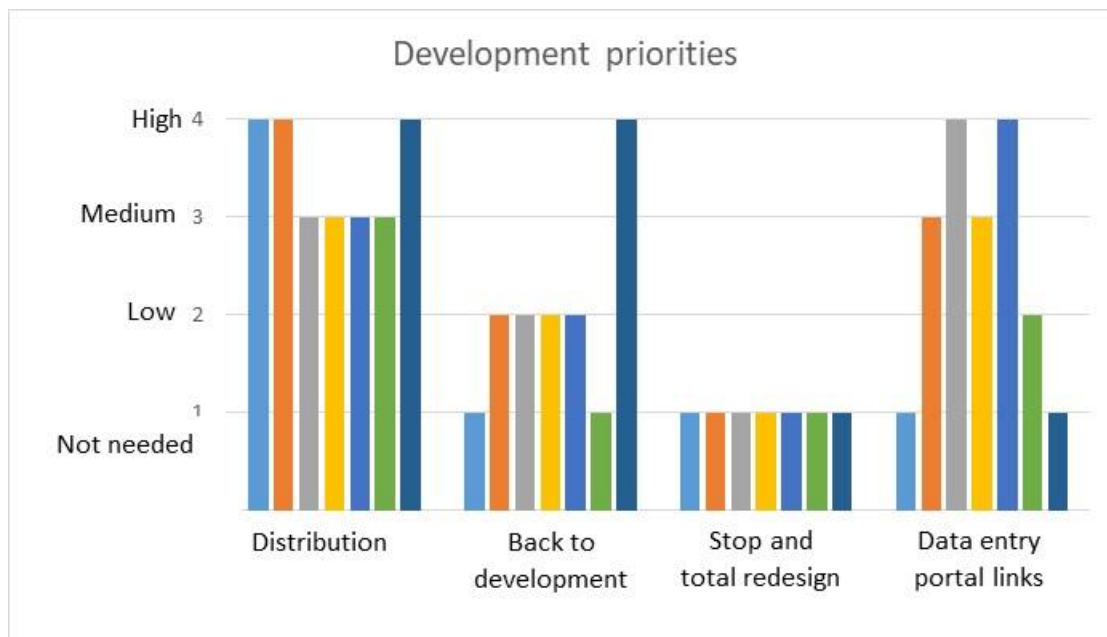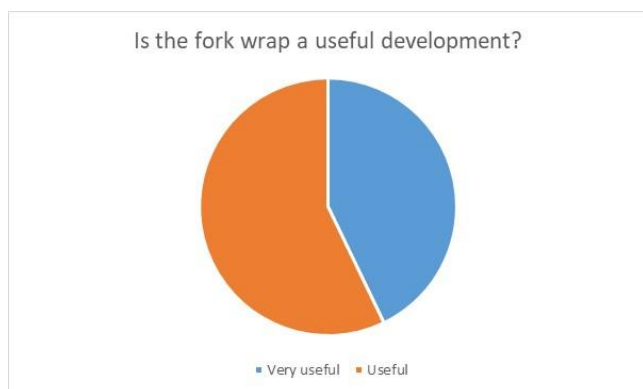

Figure 3f: Development priorities indicating testing phase and development of digital links (data or ID support) were the priorities. Nobody considered the design was flawed and should be completely re-designed.

It would be useful if downloadable too - because this would give the opportunity for people to laminate if they so wished
It made us smile - spread the happiness
Loved the fact that we could wrap it around the spade and off we went. All really liked it and got on well with it.
The press stud or other fixing is the key otherwise, one would just stick it in a pocket or bag/bucket.

Figure 3g: There was 100 % feedback that the concept was a useful development, nobody selected 'not at all' or 'slightly' useful. There were some specific written comments about the prototype – noting the value of the fixing.

Feedback was requested for an alternative design because of the opportunity to add on QR codes to link to identification guides or results portals.
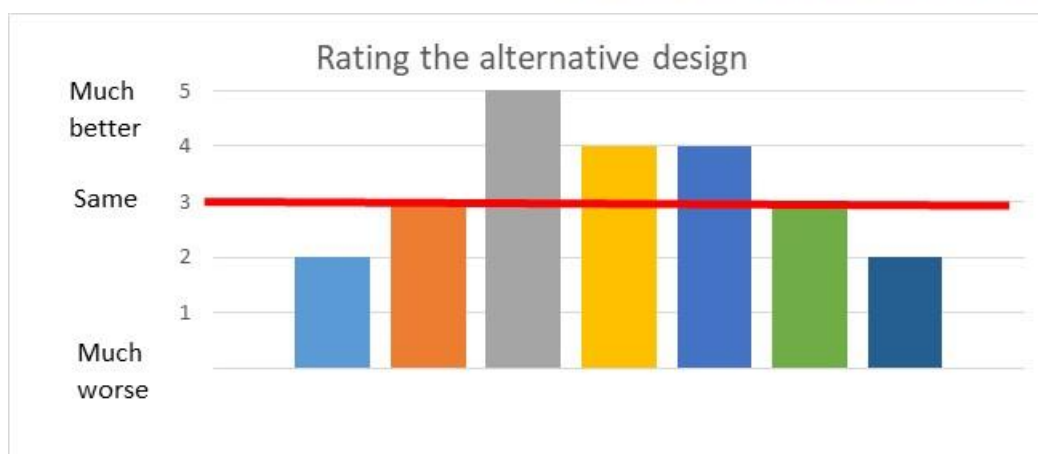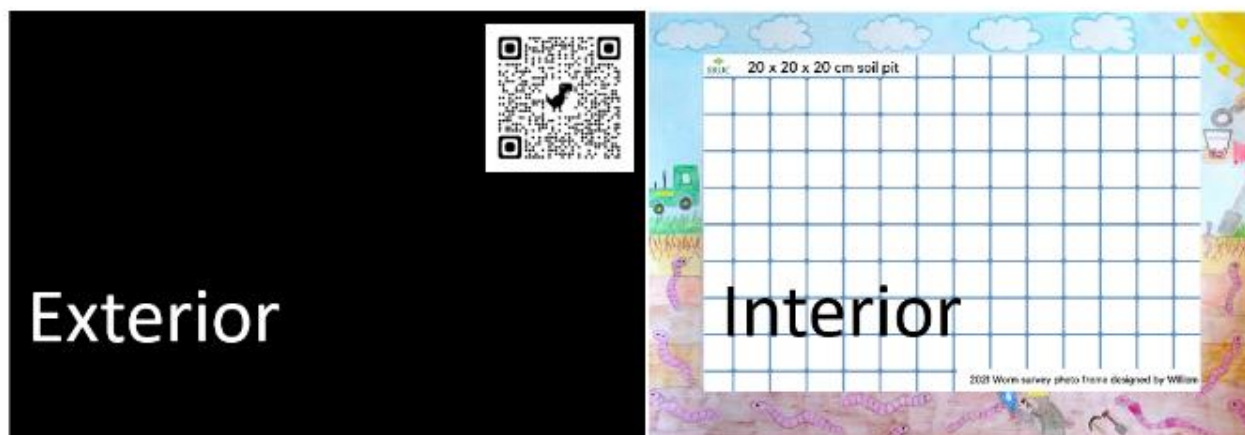
Alternative prototype

Figure 3h: There was a mixed response to the alternative prototype with a plain exterior (and QR code stickers). None the less, the QR code concept was liked (Figure 3e, development priorities).

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Conclusion

The prototype is a minimum viable product (MVP) and wider distribution was recommended by reviewers.

1) Personalisation or 'do-it-yourself' elements was not relevant to participation, in agreement with the 'soil life' colouring designs.
2) The design was satisfactory, it is a not a one-use only product and not-for profit costs were acceptable as the development was considered useful.
3) Attention was directed towards functionality – specifically QR code links for identification support or data entry.
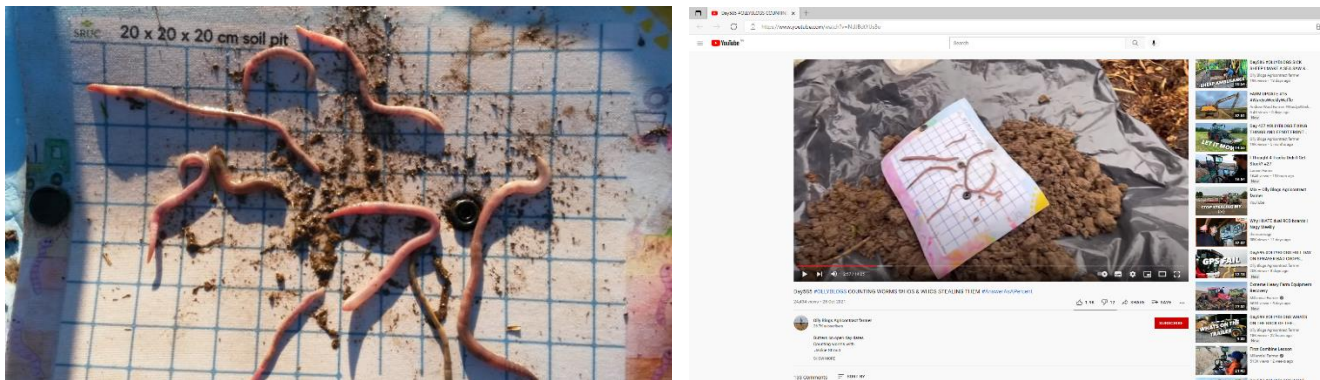
Example uses by volunteers (Figure 4):

Figure 4: Use of the photo template. The photos are good quality – in focus. The earthworms are washed enabling identification.