TEACHING MAP READING AND NAVIGATION

Chris Sweetman (Outdoor Adventure Navigation Group) in action, taken by his wife.

How and what should we teach today's outdoor navigators to ensure wayfinding success? Nigel Williams, National Navigation Award Scheme (NNAS), from the Outdoor Adventure Navigation Group explores these questions.

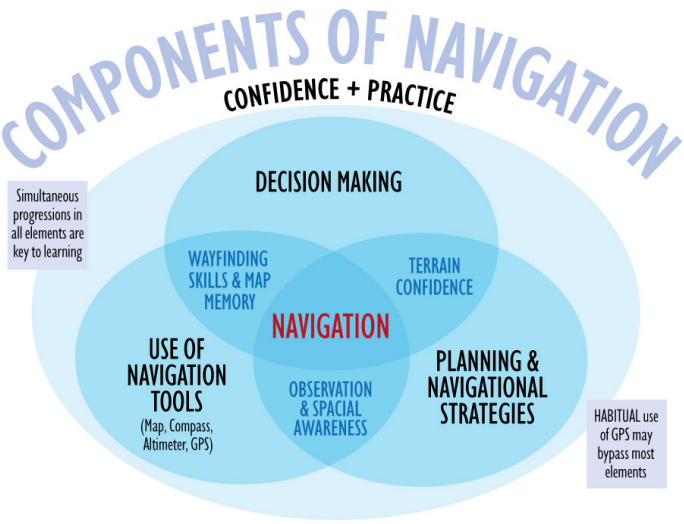
In 2022, the RIN created the Outdoor Adventure Navigation (OAN) Special Interest Group (SIG) to explore the importance of navigation for people involved in different outdoor adventure activities. Around 20 years ago, RIN's Navigation on Foot SIG disbanded after the development of digital maps and phone-based GPS location apps made the group appear obsolete. However, most outdoor activities still require some level of navigation competence despite technology advances, and often people have discovered that technology is not reliable in many outdoor adventure places. How are people now using navigation tools such as map and compass, and navigation strategies such as contour interpretation and celestial information in outdoor adventures? Technological innovation continues to change the face of navigation and our understanding of human navigation and cognitive processes is being explored by RIN's Cognition and Navigation SIG. By developing new knowledge of all these elements the Outdoor Adventure Navigation Group has the opportunity to assess today's outdoor navigation behaviour and take a lead on how to teach navigation skills to a population becoming increasingly reliant on technology for outdoor navigation.

A 2022 UK survey of walkers, conducted by marketing research company OnePoll for the Ordnance Survey (OS), found that 56% of respondents admitted to having recently been lost due to an inability to effectively read a paper map or use a digital map. 10% admitted to calling Mountain Rescue for assistance but what would they have done if their phone battery was dead from navigation usage? The advice given (OS, July 2022) was interesting. It mentioned map reading skills and being able to give a grid reference which is tricky for even an experienced map reader when lost in woods. No advice was given on how to progress navigators' skills in line with their adventure ambition, or research and plan navigation for outdoor adventures, or select and follow appropriate routes, or maintain observations during an activity, or how to make informed decisions based on map-based information.

The following diagram aims to illustrate the connections between different aspects of navigation. A map is a navigation tool communicating information that assists with decision making. Navigation involves a range of complex cognitive processes with map reading being one element of this.

Do we need all the map reading skills before we can safely navigate? Do people assume navigation and map reading are the same thing?

Figure 1: This graphic showing the components of navigation illustrates how the practical skills of navigation (in black) and the cognitive navigation processes (in blue) overlap.
Image credit: Nigel Williams



There are many books and websites on how to map read and how to use a compass but outside of orienteering there is virtually nothing on how to teach navigation (including map and compass skills). One definition of map reading is "the act of interpreting or understanding the geographic information portrayed on a map" (geographyrealm.com website). Map reading is often associated with the teaching of geography and is delivered as static classroom-based plotting and numeracy exercises with no active decision-making or real consequences. Navigation has been defined as "the process of determining and maintaining a course or trajectory from one place to another" (Gallistel 1990), and is also sometimes described as "wayfinding". It is interesting that we talk about Satnav and not about Sat map-reading; we talk of the Global Navigation Satellite System and not the Global Mapping System, and indeed our very own SIG is for Outdoor Adventure Navigation and not Outdoor Adventure Mapping. We talk of navigating our way through a process or even life. It describes movement or a journey. It is not possible to replicate that experience in a classroom.

It seems fundamental that if we can clearly define these two

What navigation really looks like.

activities, map reading and navigation, we could influence that mind set. We could also use our understanding of wayfinding and cognitive navigation to influence people's navigational confidence and the how, why, what, where, and perhaps who (noting possible gender biases) of teaching navigation?

Navigation is on the move decision making which can have immediate physical and emotional consequences (often good). It engages our natural cognitive navigation processes and contributes to building map memory and terrain confidence. It needs carefully managed teaching progressions across many elements from environment, terrain and context to decision-making, map scale and skills with the tools of navigation.

In the UK there is no structured methodology or specific training within education for teachers to 'teach' navigation skills. What we have now is more a culture than a thought-out methodology.

The approach in schools over the last 80 years or so seems to mainly come through geography teaching. Until reforms to the geography GCE and A Level in 2015 (see www.aqa.org.uk), there was no stated requirement to take map reading skills outdoors so there was often little engagement with what the map actually showed on the ground. And furthermore, the element of numeracy can have a negative impact for some pupils.

The other context in which young people are exposed to map reading / navigation teaching is through uniformed youth organisations where many of the volunteer instructors have been exposed to military map and compass skills training passed down through generations and they continue to teach as they themselves were taught.

The navigational needs of recreation are much more reliant on terrain confidence, wayfinding and on-the-move decision-making. The needs of the military are more around static plotting, numeracy and communicating information. This is understandable when one considers the military context of WW1 and the requirements to communicate accurately plotted positions and directions. One incorrect digit could result in friendly fire deaths.

For hundreds of thousands of years humans have navigated developing spatial awareness and the cognitive navigation pathways to wayfind, yet we tend to start teaching navigation skills based on the map and base plate compass which have only been around for recreation for the last 100 years.

An approach more connected to our cognitive processes might simply be a guided walk along a path without a map and so developing terrain confidence, observation and spatial awareness skills. Pointing out features and asking questions about the journey prior to them drawing their own map of the route taken. Then introduce some simple map skills and repeat the route with the map connecting the symbols with the terrain in context. This is an approach being developed by the National Navigation Award Scheme (NNAS) through

A mirror compass. Credit: Chris Sweetman

its navigation teaching methodology.

One word that often appears in papers though is "confidence"; confidence in terrain, decision-making and skills play a significant part in learning to navigate. Yet decision making for instance is rarely mentioned in teaching the skills. It also brings in topics of heuristics, anxiety and stress in relation to becoming lost – "waylosing".

Another challenge for the novice is starting with maps around 1:50,000 scale which lack a lot of the detail the novice will look for and sees on the ground close to them. This can also inhibit their confidence. It makes more sense to start with a 1:10,000 map usually an orienteering map, at this scale almost everything the novice sees is marked. Subsequent progress to maps with less detail should be made over time as confidence builds to look farther afield and interpret what isn't on the map as much as what is.

Elite orienteers are probably the best on foot navigators in the world, they have a very clear navigation teaching methodology and skills progressions, all teachers and coaches receive training and qualifications to deliver that methodology. They have no writing over the map either so the brain has to learn to interpret the symbols no matter what the orientation is.

Because it is a niche running sport, other recreational activities seem reluctant to engage with it and assume orienteers navigate efficiently because they can run fast, rather than asking how do they become proficient navigators?

If we could engage children or novices with simple progressions in terrain, navigation and decision-making skills might we give them increased confidence to explore and reduce the anxiety of getting lost, help increase their spatial awareness, better connect them to the environment and provide a skill that could offer them wider health and lifestyle choices in the future? Could science help inform the teaching methodology. As a fair proportion of research involves trial participants who can have a range of map reading or navigation experience could a clearer methodology in the long term provide science with a better base line of prior experience in their research participants?

Future articles from the Outdoor Adventure Navigation Group will explore what we can learn from various disciplines that fall under our umbrella. If you'd like to know what we can learn from how orienteers navigate, for example, please keep an eye out for us in the magazine.

If you'd like to get involved with the committee please contact Clare Stead at comms@rin.org.uk

Reference:

The four "top tips" given to help people avoid getting lost were published by OS in a press release that also promoted National Map Reading Week in July 2022: https://www.ordnancesurvey.co.uk/newsroom/news/have-we-all-lost-our-sense-of-direction

Further details regarding Geography at GCSE level can be found at: https://www.aqa.org.uk/subjects/geography/gcse/geography-8035/subject-content/geographical-applications

Thanks to the Outdoor Adventure Navigation Group committee for the insightful editorial comments that have helped to shape this article.