

A geotechnologist network

Un réseau de géotechnologues

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ABSTRACT: A Geotechnologist Network provides a platform and community to recognise and promote the valuable contribution to the Ground Engineering Industry delivered by skilled, knowledgeable and practical individuals that are critical to the delivery of a project. Whilst these individuals may not have the traditional education and qualifications as attained by chartered geotechnical engineers, their project contribution and responsibility, certainly equals and often exceeds those with more theoretical knowledge but lacking in practical experience. Network activity, including regular online webinars, serves to share the experiences of practitioners in the industry. These practical webinars are interlaced with other learning events, aimed to encourage practitioners to increase theoretical knowledge. This encourages progression to achieve qualifications, enabling individuals to aspire to advance within the industry. Webinars shared and delivered between practitioners, are growing exponentially, with this growth anticipated to continue in Europe and Worldwide.

RÉSUMÉ: Un réseau de géotechnologues fournit une plate-forme et une communauté pour reconnaître et promouvoir la précieuse contribution à l'industrie de l'ingénierie des sols fournie par des personnes compétentes, compétentes et pratiques qui sont essentielles à la réalisation d'un projet. Bien que ces personnes n'aient peut-être pas l'éducation et les qualifications traditionnelles acquises par les ingénieurs géotechniciens agréés, leur contribution au projet et leur responsabilité sont certainement égales et souvent supérieures à celles qui ont des connaissances plus théoriques mais qui manquent d'expérience pratique. L'activité de réseautage, y compris les webinaires en ligne réguliers, sert à partager les expériences des praticiens de l'industrie. Ces webinaires pratiques sont entrelacés avec d'autres événements d'apprentissage, visant à encourager les praticiens à accroître leurs connaissances théoriques. Cela encourage la progression vers l'obtention de qualifications, ce qui permet aux individus d'aspirer à progresser dans l'industrie. Les webinaires partagés et dispensés entre praticiens connaissent une croissance exponentielle, et cette croissance devrait se poursuivre en Europe et dans le monde entier.

Keywords: Geotechnologist; network; skilled; knowledgeable; practical.

1 INTRODUCTION

It has long been recognised that there are many talented skilled, knowledgeable and practical individuals (Figure 1), working in the Ground Engineering Industry; these individuals have a wealth of knowledge, that could be shared with others, but they rarely get the opportunity to speak at public society events. To promote the interaction between individuals with such attributes, the British Geotechnical Association (BGA) has initiated a Geotechnologist Network, as it is considered that the term Geotechnologist is appropriate to describe any skilled, knowledgeable and practical individual, with experience working in the Ground Engineering Industry. A geotechnologist is unlikely to be qualified in the professional sense, nor following a traditional route towards qualification. With a “Technologist” defined as an individual with a high level of skill and ability, who applies their scientific knowledge to the practical aims and purposes of human life, and “Geo”



Figure 1. A geotechnologist monitoring on site.

originating from the Greek word meaning “earth”, it follows that a geotechnologist can be defined as:

An individual with a high level of skill and ability, who applies their scientific knowledge to achieve the practical aims and purposes of human life relating to the earth.

This definition could apply to individuals carrying out activities including, but not limited to, site investigation, laboratory and field testing, field monitoring, geospatial mapping, dewatering, piling, grouting, numerical modelling, drafters of drawings etc. The field is wide open, and we do not pretend to know all the possibilities.

The purpose of this Geotechnologist Network is to assemble skilled and practical individuals together as a knowledge-sharing community. Exactly how skilled and knowledgeable individual practitioners could assemble as a community of Geotechnologists was not known at the beginning of our journey.

Nevertheless, with the outcome to include and involve skilled and practical individuals within the Ground Engineering Industry, we chose to start our journey without knowing every step ahead of time, but reflecting on progress and then pivoting our guidance as feedback was received.

2 THE CONCEPT

The BGA is the United Kingdom Chapter of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE). The ISSMGE is a Learned Society, with one of the objectives being: *“the promotion of international co-operation amongst engineers and scientists for the advancement and dissemination of knowledge in the field of geotechnics, and its engineering and environmental applications.”*

The object of the BGA, along with other national learned scientific societies, share the mission of: *“the advancement of public education in the subject of soil & rock mechanics, and engineering geology, and their application”*

with these learned societies existing to promote:

- (i) an academic discipline,
- (ii) a profession, or
- (iii) a group of related disciplines.

The authors recognised that whilst our Geotechnical Societies are very good at items (i) and (ii), by promoting those in the academic and professional world; through presenting lectures in grand theatres, with statues and names of famous engineers carved in stone around the walls, we have not recognised in the same way the individuals with skill and practical knowledge within item (iii) on whose shoulders much of the weight of the industry is supported.

With this accepted as an inherent weakness in our lack of recognition of skilled and practical individuals working within the Ground Engineering Industry, the BGA committed to initiating the development of a programme to incorporate those in the Ground Engineering Industry, who did not always enter our industry from the traditional qualification route, but nevertheless provide a hugely valuable contribution to the industry.

As published in Ground Engineering, in 2019 (EMAP, 2019a) Prof. Kelvin Higgins (author), as newly appointed Chair of the BGA, presented his wish to develop a technician community within the BGA. This followed a round table discussion, at which the need for advances to be made in the education of a Geotechnologist community through increased learning opportunities, and for continual professional development (EMAP, 2019b). A meeting was held with several employers to develop ideas. All were extremely supportive, but with the outbreak of the COVID-19 pandemic, the initiative stalled.

In 2022, BGA Executive member Dr Stephen Thomas (author) accepted the challenge set, and took the lead in developing this initiative in practice. Before the launch of this initiative in 2023, Dr Thomas undertook a year of research to provide guidance and focus on where this initiative could best deliver results.

This paper presents the key findings of the research, and whilst not a fully comprehensive research study, can nevertheless be used to advance this initiative and apply it to other societies in Europe and Worldwide.

3 THE JOURNEY

In the early days of the development of the initiative, the focus started with recognising those individuals who were, we thought initially to be at the periphery of the Ground Engineering Industry, but did not have an association of their own with which to belong.

The BGA Executive Committee considered initially the action of forming a sub-group within the BGA to which we could invite those who consider themselves not recognised to be openly acknowledged as valued individuals who provide a central and major contribution to the ground engineering community.

Our initial focus, we later learned, was centred too much on ourselves, i.e. the academics and professionals; inviting skilled and practical individuals to become one of us. However, after speaking to many of these skilled practitioners on a personal level, it became clear at an early stage, that without question, backgrounds were immensely varied, and much more multi-dimensional than the classical monoculture of School and University, Graduate-Engineer, and

ultimately a Professional, and that is just speaking about the authors. With this new focus in mind, based on our experience of working with skilled practitioners in the industry, enhanced by one year of speaking and learning from numerous practitioners explaining our vision to organise a society, we received an interesting clarity of response.

3.1 Opinion of professionals and academics

Whilst not a vast survey, there were some striking similarities in comments. The first was their perception of professional engineers, most of whom had studied and received higher degrees at university. It was as if we were Greek Gods, looking down at them from afar above the clouds. However, as authors, we are acutely aware that those working daily with geotechnology, are far more knowledgeable in essential practicalities to ensure solutions are implemented correctly in action.

3.2 Self-opinion of practitioners

Many practitioners consulted, described themselves as lacking in confidence with regard to their theoretical knowledge. They often referred to themselves as “*just me*”, or “*it is only my view*”, as well as having the opinion of their own knowledge compared to us in more fruitful and less confident language.

The lack of confidence in their own knowledge was despite the fact that many of the individuals conferred with, had extraordinary major project responsibility. For example, some held the responsibility for sinking shafts in loose saturated ground, whilst their workers were digging and launching a tunnel, describing their minute-by-minute decisions of ground strength, again in more fruitful language than in a standard textbook.

This practical experiential knowledge is gained from repeated observation, and in the authors’ view, is no less valuable to a project. In fact, this is possibly more valuable than theoretical knowledge, because during construction processes, especially underground construction, the ground encountered is rarely as expected, and real-time decisions are often made from observations by skilled and practical individuals, rather than by those with more theoretical knowledge (Figure 2).

The individuals we spoke to were generally unaware of the much bigger picture with regard to the design and construction process, and particularly how this process depends to a high degree on their skill and knowledge. Our initiative is aimed at helping and guiding these individuals to understand where the meticulous work they accomplish contributes to the overall process. This dissemination of information has been achieved by providing speakers who have focussed on their role within a project (the importance

of investigations, testing, monitoring etc.) or by interaction between the Geotechnologists themselves exchanging ideas.



Figure 2. Geolabs laboratory technician.

As previously noted, the initial feedback from employers was very positive and they were willing to provide tangible support for this initiative. They were keen that their workforce became more engaged and understood the importance of their work.

4 REDEFINING A LEARNED SOCIETY

The essence of the authors’ passion is that as a society we need to recognise all aspects of learning within our field, including academic, professional and practical.

Whilst the initial thoughts of the BGA were indeed to assemble a community of skilled practitioners, the initiative has now developed into one in which Geotechnologists are very much encouraged to lead and develop each other. As a consequence, the BGA plan is now to incorporate the Geotechnologist Network as a sub-group of the BGA, so having its own identity (similar to the highly successful Early Career Group), but at the same time being able to benefit from the established BGA administrative structure.

The fact is that many substantial developments and innovations arise from situations that are observed in practice. Here skilled and knowledgeable individuals, of the focus of this initiative, pull together to develop solutions in practice, that rarely require the modelling of second-order differential equations!

Learning resulting from developing solutions in practice, is known as experiential, or kinaesthetic learning, as opposed to theoretical learning.

We often treat these types of learning as either-or. Either we are academic, learned, theoretical thinkers, or we are practical, hands-on, technicians.

Whilst we all know that the most balanced and rounded knowledge is a blend of both theoretical and practical understanding, our learned societies do not necessarily recognise and reward the practical end of the knowledge spectrum.

In 1984, David Kolb (Kolb, 1984) published his groundbreaking Kolb Learning Cycle as depicted in Figure 3. This learning cycle is a pedagogical approach to human learning. He developed this model to teach his students at Stanford University. His goal was to help them learn better through self-directed study.

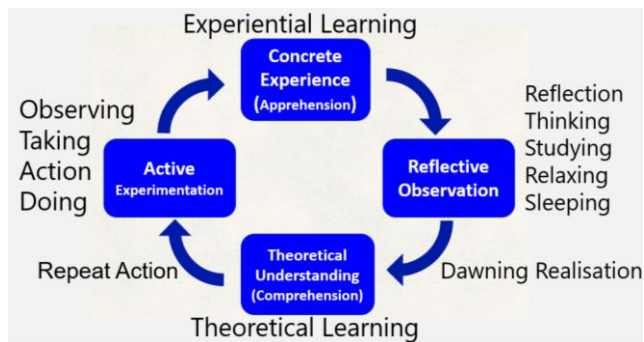


Figure 3. Kolb's four stages of learning (Kolb, 1984).

This theory of learning demonstrates how the practical knowledge gained by Geotechnologists can be very valuable to the Ground Engineering Industry.

Whilst a generalisation, those steeped in academic thinking can often focus around the bottom right area of the Kolb cycle i.e. reflecting & comprehending, with less focus on taking action in practice, so missing out on observation and apprehension.

Conversely, practical, skilled and knowledgeable individuals can spend their lives taking action, experiencing, observing and understanding behaviour through apprehension. This style of kinaesthetic learning, whilst gaining experience, can result in not fully comprehending the reasons behind the behaviour observed, and can miss out on a deeper understanding.

It is clear from this Kolb cycle, that when there is a full cycle of action and observation, with reflection and study, this results in both apprehension and comprehension, so leading to a deeper learning.

To this end, it is one of the aims of the Geotechnologist Network that individuals share their experiences, and then provide encouragement and guidance towards organisations that can provide tuition, learning and qualifications. This is being achieved initially by running webinars, delivered every two months, by the practical and skilled Geotechnologists themselves. Figure 4 presents the initial webinars presented and scheduled.

Date	Name & Organisation	Webinar Title
2023 Sep	Stephen Thomas, BGA	A Geotechnologist Network
2023 Nov	Christopher Wallace, Geolabs	Things that affect soil strength
2024 Jan	Christopher Swainston, Consultant	Environmental Sampling: What can go wrong
2024 Mar	Brian Sharkey, One Bore Tunnelling	Lab coats: white, Brown or Hi-Viz. Research & Innovation in the Workplace
2024 May	Jim Shields, RoGEP	Routes to becoming a Ground Engineering Professional
2024 July	Julian Lovell, Equipe Group	Diplomas in Field and Laboratory Geotechnical Activities

Figure 4. Webinars by the Geotechnologist Network.

The development of the webinars, delivered by the growing network of geotechnologists, has proved most successful on a number of counts.

- (i) The network interest is growing exponentially.
- (ii) A Geotechnologist sees their skills being shared.
- (iii) A Geotechnologist sees their skills as recognised.
- (iv) A Geotechnologist is directed towards learning.
- (v) Theoreticians see more practical examples.

COMMENT

This initiative of a Geotechnologist Network is fully consistent with the aims of a learned society. It is not the intention of this network to provide a qualification or certification. However, this network can provide a catalyst for encouraging and guiding individuals towards organisations that provide further education to provide advancement to practitioners in our industry.

Much is to be gained by all working in our industry from the interaction with individuals with such practical skills, knowledge and experiences. The aim is that this initiative will promote these interactions and help develop and advance the pool of skills and knowledge within the entire geotechnical community.

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