Technological advancements in surveying: academic and industry perspectives

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Can higher education and employer interaction bridge the gap between theory and practice to lead to a future-proofed workforce?

IN the last couple of decades, surveying technologies have evolved significantly. The technological advancements have paved the way for remarkable changes to the working practices of surveyors. The changes within the profession pose a question if the surveying curriculum has been keeping pace with technological advancements and contemporary surveying practices.

Students on surveying courses must be familiar with newer surveying technologies such as laser scanning, digital terrestrial photogrammetry, robotic total stations, remote sensing satellites, LiDAR and use of unmanned aerial systems (UAS). 3D scanning, building information modelling (BIM) and Internet of Things technology are the new norms of the industry and not an optional extra. The core skills and competences required to produce competent experts in the professions have changed.[1] Increasing opportunities are open to those who demonstrate the calibre and experience to use the technologies that are changing at an unprecedented pace.

Challenges faced by academics

Some longitudinal studies in UK universities have been carried out to note the changes in surveying education over the last few decades.[2] One such study[3] noted that changes in industry practices had led to changes in the surveying curriculum. It was also found that there was a surge in the use of technology and practical exercises in teaching surveying.

It is evident that the surveying curriculum needs to continuously reflect the changes in technological advancements. The traditional levelling has to be matched with robotic total stations to give students an overview of the technology used by the industry. It is however essential that students understand the basic concepts of land surveying. Reading an E-type levelling staff and understanding line of collimation are still required as part of the conceptual understanding. This does pose newer challenges to academics, as the curriculum must have a balance of basic understanding of theoretical concepts and the use of digital technology.

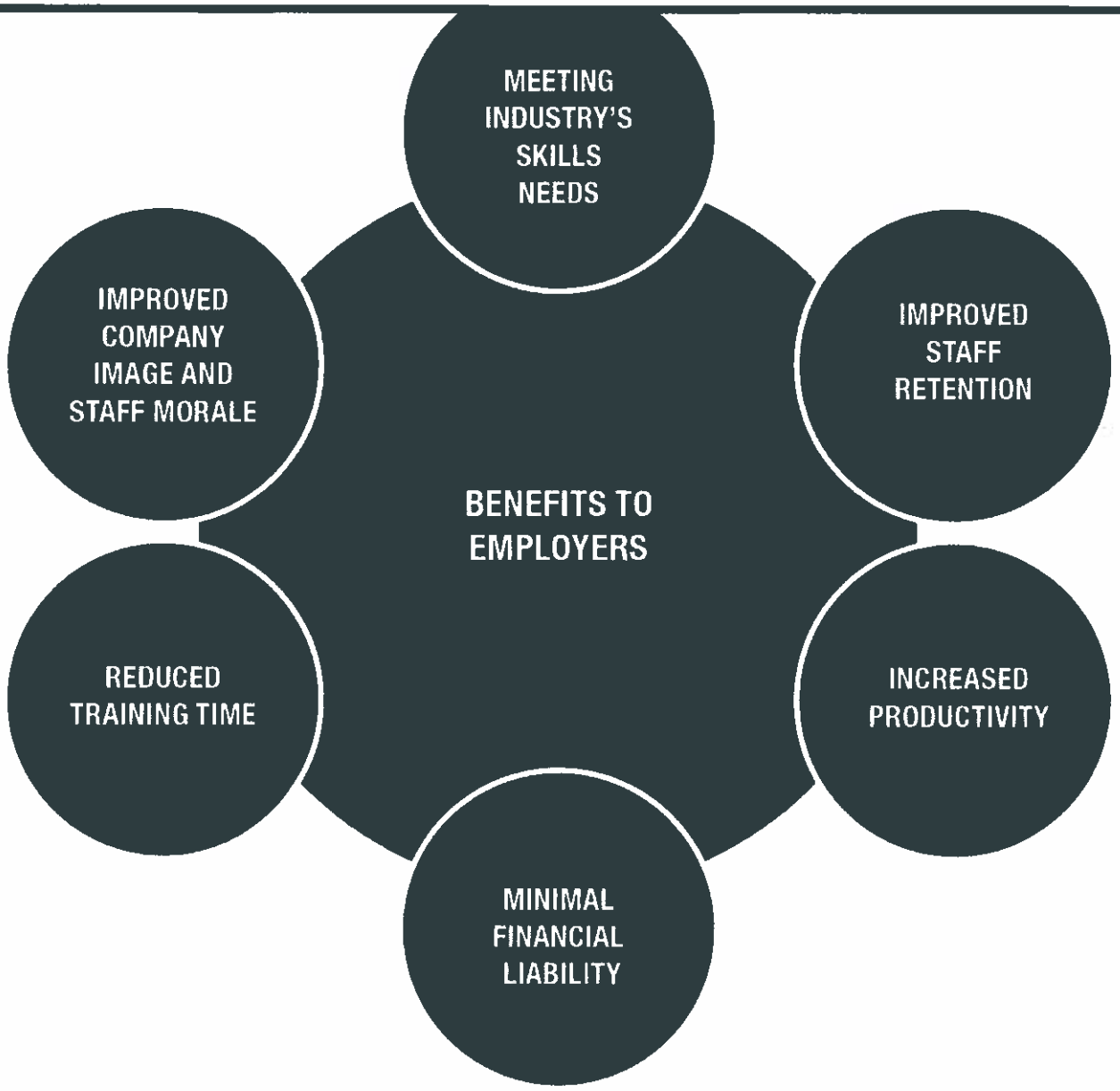
Building surveying tools have changed significantly since the days of the dampmeters. Use of non-invasive techniques such as ground penetrating radar (GPR) and thermographic cameras allow identification of defects and building performance issues. Devices such as UAS have also been gaining popularity.

It is not always possible to relate to these technologies via a virtual learning platform or mere use of videos or PowerPoint presentations. Practical demonstrations are needed for students

With the increased pace of technological advancement, the challenge for academics is to continuously incorporate these into the curriculum. Inclusion of more practical exercises demonstrating the use of latest technologies require additional resources in the form of procurement of extensive and expensive equipment. Even if these are made available, it places significant demands on staff time and requires appropriate staff training.

How can the industry help?

One of the ways in which the surveying industry can provide support is to offer more and more opportunities of work experience. For example, imagine the wealth of knowledge and experience that could be gained by a student who gets an opportunity to shadow a commercial UAS surveyor for a week! The practical use of UAS to provide a visual or thermographic survey of buildings could be priceless for students as classroom environments would not be able to accommodate such a real-life industry-led experience. Workbased surveying exposure by means of internships is a proven way forward to get students that much needed practical experience.



Graduates equipped with state-of-the-art equipment, technologies or industry practices: benefits to employers.

Benefits to industry

The industry acknowledges that widened academia-industry interaction would be beneficial to employers as the development of professional abilities would create a more 'work-ready' graduate.

Better technological insights would mean lesser training time, improved staff retention and morale. From the employers' perspective, new graduates fully equipped with an exposure with state-of-the-art equipment, technologies or industry practices bring in a wealth of benefits as listed in the diagram below.

Challenges faced by smaller practices

Larger companies have a structured approach to these in form of summer placements, internships and graduate schemes. Smaller practices, however, do not have adequate resources to support and monitor an intern or a student on work experience schemes. Time

have to allocate significant time to train a new graduate, who might not have the opportunity to be exposed to the sophisticated technologies and data collection methods.

Finally

Use of sophisticated technologies are changing the landscape of the surveying profession. This transformation has made it possible to significantly increase the productivity of surveying companies.

The time is ripe for the curriculum to reflect these advancements. Higher education and employer interaction can help bridge the gap between theory and practice and lead to a future-proofed workforce.

Indira Chauhan MICE MCInstCES MCIOB AssocRICS, FHEA Course Leader for BSc(Hons) Building Surveying, School of Computing and Engineering, University of West London, with Mita Rajani MCIOB AssocRICS, Building Surveyor
indira.chauhan@uwl.ac.uk

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