

Civil Engineering Graduate Apprenticeships: A feasibility study into development of an MSc programme based on review of current undergraduate provision

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Abstract: This paper details the findings of a study undertaken at Edinburgh Napier University to assess the feasibility of developing an existing Graduate Apprentice programme in Civil Engineering to a MSc level. Using a mixed methods approach, data from a series of questionnaires and structured interviews (n=32) conducted with final year Apprentices at Edinburgh Napier University was reviewed relative to existing literature on Apprenticeships and Work Based Learning. Results show that the current level of satisfaction with existing provision to be high with a good level of interest in continuing study to post graduate level. This research will be of relevance to anyone involved in the development and delivery of Civil Engineering Graduate Apprenticeship programmes in Scotland and the UK.

Keywords; Graduate Apprentices, Civil Engineering, Work Based Learning, Post Graduate study

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1. INTRODUCTION

1.1 Graduate Apprenticeship programmes

Launched in 2017 and now in their 5th year of delivery, Graduate Apprenticeships (GA) have provided over 3500 individuals access to degree programmes. The ability to “*earn while you learn*” affords career progression opportunities to those historically excluded from Higher Education and in doing so, provides a direct link between Universities and Industry via the apprentice. Recognising the value that GA programmes can bring to Higher Education, Edinburgh Napier University has been an early adopter of the GA approach to learning. At present, Edinburgh Napier offers undergraduate apprenticeship programmes in software development, business management, building surveying and civil engineering. It is the successful delivery of the civil engineering programme and its potential for development to a MSc level of study that forms the focus of this paper.

1.2 Current programme structure and delivery

In 2018, Edinburgh Napier’s Civil, Transportation and Environmental Engineering group developed its GA model of study based on the following principles:

- Entry into the programme should take account of non-academic qualifications through the development of an appropriate Recognition of Prior Learning (RPL) policy

- Study should be able to be undertaken alongside work and, wherever possible, utilise the workplace as a learning environment
- In class attendance should be limited to one day per week to allow apprentices to balance the requirements of work and study
- The developed programme should be the same duration and should result in the same degree qualification as an equivalent Full Time (FT) programme of study – with respect to the attainment of a BEng (Hons) degree this requires the student to attain 480 credits in accordance with the Scottish Credit and Qualifications Framework (SCQF)
- In order to promote the identity of being a learner and ensure a positive student experience, GA students should study alongside FT contemporaries
- The degree programme should be accredited as providing the required educational basis for recognition by professional bodies associated with Civil Engineering

To achieve these goals, the GA Civil Engineering programme was developed so that it shared not less than 70% of its content with the existing FT programme of study accredited by the Joint Board of Moderators (JBM), the professional body responsible for the accreditation of Civil Engineering programmes throughout the UK. This approach had the advantages of:

- Making use of existing programme infrastructure allowing for GA students to be taught alongside full-time students, this approach also minimises the need for additional staff resource to deliver the programme
- Increasing the likelihood that the new programme will be accredited due its high proportion of shared content with an already accredited programme

The programme structure adopted was developed by retaining modular content identified as “core threads” i.e those deemed to be requirements by the accrediting body and replacing all other content with Work Based Learning (WBL). Due to the modular nature of the FT programme (based on 6×20 credit modules per year) this was achieved by reducing the delivery of in class content to 4 modules per year (80 credits in total) and making up the remaining 40 through WBL. In practical terms, this approach also allowed for in class delivery to be limited to one day per week facilitating the apprentices’ ability to work and study at the same time.

This GA programme as outlined launched in 2018 with the first enrolled cohort now due to graduate in autumn 2022. Feedback from this group on their experiences of the programme and future career plans was used as a basis for this paper.

1.3 Aim and objectives

The aim of the research associated with this paper was to determine the feasibility of expanding the existing undergraduate Graduate Apprenticeship model to a Masters/ postgraduate level of study. To achieve this, the following objectives were developed:

1. To assess whether the GA format is suitable for the current cohort studying Civil Engineering
2. To establish whether the Apprentices would consider continuing their education if a suitable MSc GA programme was available

3. To gain information about what GA programmes and course content would appeal to the current cohort if an MSc were to be created
4. To gain insight into whether the current employers of GAs were supporting them in their studies and whether employers may support further study in the same format
5. To gain insight into what (if any) further research was required to support extending the GA programme to include MSc an option

The completion of objectives 1 and 2 was pursued through the undertaking of a literature review on approaches to Work Based Learning programmes of study in combination with a series of structured interviews with current GA students. It is the summarised findings of this work which is detailed in this paper.

2. METHODOLOGY

2.1 Literature review

The cross-sector Wolf review of vocational learning (Wolf, 2011) represented a strategic appraisal of apprenticeship programmes in UK. Subsequent research by Ross and Riley (Ross and Riley, 2018) has found that apprenticeships have been fundamentally lacking in terms of quality, with many apprentices finding themselves in “dead-end jobs” following completion. These findings can be viewed in the wider context of long running criticisms directed at Higher Education centring on its lack of ability to deliver transferable skills to the workplace (Rowe, 2018). A review of literature on apprenticeships in the UK identified the following themes with respect to reform requirements:

- An overall need to improve productivity through up-skilling of the existing workforce
- A need for employers to invest more in high-quality training for their staff
- An ambition to improve social mobility and create more opportunities for young people
- Removal of obstacles preventing university and businesses to collaborate

According to Bravenboer (Bravenboer, 2018), implementation of these reforms could result in a paradigm shift with respect to the way degree programmes are delivered, with the divide between academic and vocational work no longer recognised and work integrated learning being the norm.

The benefits of this possible future are great especially to those traditionally excluded from Higher Education due to financial reasons with the ability to “*earn while you learn*” removing this hurdle. The increased opportunities afforded through this mode of study are acknowledged by Universities UK who highlight that apprenticeship study, particularly degree level options, appeal primarily to those coming from a lower socio-demographic background.

With respect to the construction sector, Graduate Apprenticeships provide a viable option to address the current skills shortage which is recognised at national government level (The Scottish Government, 2019). Central to the resolution of this issue is the close collaboration of academia and industry, a relationship which is directly facilitated through the apprenticeship model (Ross and Riley, 2018).

To determine the level of interest in a potential MSc programme in Civil Engineering developed from the current undergraduate framework, a series of structured interviews were carried out on a sample group of apprentices currently studying on the BEng Civil Engineering Graduate Apprenticeship programme at Edinburgh Napier University.

2.2. Interviews

The structure and format of interviews and questionnaires was influenced by approaches outlined by Smithson (Smithson, 2000) and Cohen (Cohen et al., 2018) with NVIVO software being utilised for the purpose of data analysis. Research was conducted via a series of one hour focus groups, each group comprising of 5 apprentices from the BEng Civil Engineering programme. Interview groups comprised of individuals from across the 4 years of study.

2. RESULTS

2.1 Respondent demographics

Participants in the research were all currently studying on the BEng Civil Engineering Graduate Apprenticeship programme at Edinburgh Napier University with 38% of respondents currently undertaking their final year of study. Most identified with the role of technician or Engineer. Ages ranged from 17 to 51 with the majority being in the 17-31 group and 65% identifying as male. All respondents identified as being white with 60% giving their highest qualification attained as either an HNC or HND.

2.2 Responses to interviews and questionnaire

Levels of satisfaction with the current programme were found to be high with 97% of respondents indicating the programme had met their expectations. High levels of satisfaction could be attributed to both the students experience studying at Edinburgh Napier as well as the programme structure and its ability to allow study to be fitted in around work. Regardless of reasons, overall feedback on the apprenticeship model echoed those identified via the literature review with one respondent saying:

“I think it (Graduate Apprenticeships) will overtake full-time study. I think, especially in this sort of industry.”

Issues around the GA model of study focused on difficulties maintaining work life balance, lack of recognition of the pressures faced by apprentices by some academic staff and a need to recognise the experience already gained by apprentices through their employment:

“....lecturers understanding Graduate Apprentices work full time within in the industry, and content could be tailored towards that. Some content is aimed at students with little to no experience.”

The questionnaire first looked to determine the reasons individuals gave for studying on a Graduate Apprenticeship programme by presenting them with a range of options determined via the literature review. A Likert scale was used to assess response with the percentage “strongly agreeing” shown with the reason for choosing the GA programme given below:

- I wanted to give myself better job opportunities - 77%
- Professional progression within my workplace – 62%
- I wanted the opportunity to make more money – 54%
- I am always looking for a new challenge – 42%
- Purely for the sense of achievement/learning opportunity – 25%
- I always wanted to attend University – 19%
- My employer wanted me to – 15%
- Encouragement or expectations of family, friends or partner – 4%

From this it could be postulated the primary reasons for enrolling on the GA programme appear to be accessing further opportunities and ultimately earning more money through attaining a degree qualification. When asked about future career progression and the need for further study to facilitate this, respondents indicated reasons as follows (note that respondents could select more than one option):

- 33% felt that support from their employer was critical with respect to any decision around further study
- 28% wishes to progress with further study on the premise that additional qualifications are beneficial to professional development
- 25% deemed that an undergraduate degree was sufficient to progress them through their chosen career path
- 22% had not considered further study
- 16% indicated that they would pursue this option for the purposes of achieving professional accreditation, namely Chartered Engineer (CEng) status

Responses to the questions “*Would an MSc programme delivered via the Graduate Apprenticeship model be of interest to you?*” showed that of the respondents, the majority responded positively expressing at least some interest in continuing their studies to a Post Graduate level.

Table 1 “Would an MSc programme delivered via the Graduate Apprenticeship model be of interest to you?” – Likert scale responses

Answer	Percentage Answer
Great Extent	31.3%
Large Extent	28.2%
Moderate Extent	15.6%
Slight Extent	12.6%
Not at All	12.6%

Views on the potential delivery format for a future GA model MSc programme were also gathered from respondents:

Table 2 “What would be your preferred delivery model for a potential MSc Graduate Apprenticeship programme” – responses

Answer	Percentage Answer
One Year, similar format to GA Honours course	62.1%
18 Months, similar format to GA Honours Course	31%
2 years part-time, similar format to GA Honours course	17%
Remote learning, one year	20.4%
Remote learning, 18 months	10.1%
Remote learning, 2 years	6.6%
Full-time Study, one year Standard MSc	6.9%
Part-time Study, Standard MSc (18 months – 2 years)	17.2%
<i>Note – interviewee’s given the ability to choose more than one response</i>	

Table 2 illustrates the fitness for purpose of the current GA programme structure adopted by Edinburgh Napier University and its suitability for further development. Results and answers gathered from the interview process support this view but highlight that the circumstances faced by apprentices should be acknowledged and accommodated by academics involved in the delivery of any potential programme.

2. SUMMARY AND FINDINGS

2.1 Summary

This paper presents the initial results from a series of structured interviews and questionnaires carried out to establish Graduate Apprentice views on current programme delivery with a view to establishing potential means through which to develop this further to an MSc level. Findings show there to be both a high level of satisfaction with the current programme structure as well as high level of interest amongst current apprentices to extend their studies to post graduate level.

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