

# Case study reflections on teaching education



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## Contents

- Decision

## **Abstraction**

This study summarises the literature I have read and reviewed on the instruction and research link and the closely related subject of heightening research-based alumnuss attributes. I foremost review the literature on teaching-research links, inquiry if these links are built-in in the course of study and discourse current barriers. I will discourse current policies and patterns that aim to hold a perpendicular and horizontal research and learning subject throughout programmes. I will so concentrate specifically in Information and Mathematical Sciences and reflect on personal experiences of learning and research linkage at the single and institutional degree.

## **Introduction to Teaching-Research Nexus**

The construct of the instruction and research link as a nucleus component of Higher Education Institutions ( HEI ' s ) was clearly set out in the Magna Carta Universitatum ( the “ constitutional chart ” of European Universities ) in 1988. The drift for the Magna Carta Universitarium was to increase consciousness of the functions that universities would necessitate to follow in order to get by with a changing and progressively international society. A cardinal rule of the Carta was that: “ Teaching and research in universities must be inseparable if their tuition is non to dawdle behind altering demands, the demands of society, and progresss in scientific cognition. ” ( Marga Carta 1998 ) . This is supported by positions that what truly distinguishes Higher Education is its focal point on back uping pupils ‘ apprehension of how research is continually reshaping our cognition of the <https://assignbuster.com/case-study-reflections-on-teaching-education/>

universe and a distinguishable set of alumnus properties. Ron Barnett ( 2000 ) has argued that the universe we live in is ‘ supercomplex ’ where non merely cognition is unsure, but besides that how we seek to understand such complexness – for illustration, dirt as a Carbon sink – is itself contested by different research attacks and the copiousness of information. He argues that the function of Higher Education is to assist pupils and the wider society header with that complexness, and that the key to this lies in instructors following ‘ teaching attacks that are likely to further pupil experiences that mirror lectors ‘ experiences as research workers ‘ ( Barnett 2000 ) . In other words pupils should larn and be assessed in ways that come every bit near as possible to the experience of academic staff transporting out their research. Other more matter-of-fact benefits of coherence between learning and research include enthusing the pupils about the exhilaration and challenges of geographic expedition. Understanding the research procedure itself is every bit critical as groking the item of the subject ‘ s current cutting-edge research which may be excessively dynamic to maintain up with, or excessively cumulative in nature ( Land et al 2008 ) . Healey ( 2005 ) province that “ piquant pupils in research and enquiry is one of the most effectual ways to assist pupils think like a scientist or historiographer, which is one of the most of import alumnus properties for most-discipline based degree programmes ” . If the construct of a ‘ knowledge economic system ‘ has any cogency so undergraduate instruction demands to include some apprehension of, and ability to make or utilize, research. Naming this undergraduate research and doing explicit to pupils the fact that this may good help their employability, can both assist them to appreciate better the function of research in the university and back up their hereafter

employability. Students are besides likely to derive most benefit in footings of deepness of acquisition and understanding when they are actively involved with research of all sorts. Learning activities linked to research develop portable accomplishments including the opinion to separate dependable from undependable information, the forbearance to follow longer statements, man-made ability to acknowledge forms in unfamiliar contexts and the flexibleness to work across disciplinary and cultural boundaries to bring forth advanced solutions. The work of Barnett ( 2000 ) , Healey ( 2005 ) and the doctrine of the Scots QAA ( Land et al 2008 ) purport the impression that research and instruction should be inextricably linked and this nexus is valuable in footings of the connexion that research led instruction has to knowledge and understanding at advanced degrees of acquisition. The inquiry arises as to how links between research schemes and activities can be embedded in the course of study to outdo support the pupil learning experience in ways that can heighten learner accomplishment of research type attributes.

### **Are T & A ; R linkages embedded in the course of study?**

At a high degree most people accept that incorporating instruction and research in HEI is good to scholars as it may enable pupils to get by better with rapid socio-cultural, political, economic and technological alteration in the hereafter. In the UK, recent policy-orientated research by Gibbs ( 2001 ) and JM Consulting ( 2000 ) indicates a failure of institutional schemes to associate instruction and research efficaciously, or at least to make this in a purposeful and expressed mode. There are several proposed grounds one being that in the UK separate support steams drive instruction and research

and these are basically driving them apart. Two landmark surveys of the US higher instruction system ( Boyer 1990 ) argued that the institutional focal point on ' discovery research ', i. e. research that is RAE'able in the UK, has devalued the system-wide demand for attending to quality instruction and in consequence decoupled learning from research. The institutional restraints imposed by policies together with other political drivers such as the publication of The hereafter of Higher Education published in 2003 in which it was highlighted that research in the UK should be concentrated at peculiar universities to advance international excellence resulted in a rift between learning and research activities. The UK Government has since changed its position and now acknowledges the alumnus attributes that pupil engagement in research-based instruction can develop, and to indicate to the importance of the course of study in gaining those properties.

Although it is acknowledged that learning and research linkages should be portion of university instruction there is current argument sing whether learning and research, are in fact, inextricably linked in Higher instruction learning. Hattie and Marsh ( 1996 ) researched the assorted theoretical accounts of the relationship between research and instruction and concluded: " Based on this reappraisal we concluded that the common belief that learning and research were inextricably intertwined is an digesting myth. At best that learning and research are really slackly coupled " . Gibbs ( 2002 ) states that " most people, including myself, believe that research can profit instruction " . However, " in pattern, it is pretty clear that, on norm, it does non " . This he suggests is because institutional schemes for research and learning have tended to handle research and instruction as wholly

separate affairs. This is exemplified by some establishments offering learning lone assignments and this clearly undermines any claim that research is a requirement for high-ranking instruction ( J M Consulting and Associates, 2000 ) . The current challenge is for establishments to develop policies and pattern that embed teaching-research linkages into the course of study. One manner to develop teaching-research linkages is via alumnus properties, so some linkages, e. g. to critical thought, are about a alumnus property, which is one subset of employability issues. Enhancing research-graduate properties can be considered one of the ways of development of research-teaching linkages. During the period 2006-2008 the Scottish Sector considered the subject of heightening alumnus properties through research-teaching linkages ( Land et al 2008 ) and reported on ways in which instruction and research linkages can be embedded in the course of study for a figure of subjects, illustrated by a scope of instance surveies which show cased some of the techniques and learning activities that promoted instruction and research linkages. The work undertaken by the QAA HE ( Land et al 2008 ) in measuring the Teaching-Research linkages across Scots Universities highlighted a figure of issues including: small grounds of a structured attack to research-teaching linkages to develop alumnus properties in pattern based course of study ; challenges surround the delivering of research-teaching linkages to develop alumnus properties in practice-based course of study ; was small grounds of pupil engagement in, or cognition of, the procedure of associating research and instruction or, even more significantly, its intent ; a inclination for the research community non to prosecute in acquisition and instruction developments ; honor constructions do non needfully promote advanced work in research-teaching

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linkages and negative consequence of the Research Assessment Exercise ( RAE ) on advancing research-teaching linkages. I will now depict some of the establishment constabularies that are in topographic point to implant teaching-research linkages and get the better of some of the hurdling identified by QAA HE.

## **Interventions – Institutional Role in research-teaching linkages**

The nexus between staff research and pupil acquisition is non automatic, and has to be built consistently into the course of study, departmental, institutional and national planning. The linkage might one time hold been readily assumed or delivered with little categories, selective pupil entry, and staff with clip to learn and research efficaciously. Paul Ramsden ( 2001 ) stated: “ the chief hope for gaining a genuinely pupil centred undergraduate instruction lies in re-engineering the teaching-research nexus. Re-engineer ‘ suggests that even if one time the linkage did be, it now needs important ‘ re-inventing ‘ to guarantee it is in topographic point. There is much that persons, class squads, sections, establishments and national systems can make to hammer these links ( Jenkins et al. , 2003 ) . The cardinal focal point now is for persons, sections and establishments to come on effectual research-teaching linkages to back up the development of research type alumnus attributes to foster heighten their subjects pattern and policies. Briefly the institutional attacks for implanting research-teaching linkages into current pattern include:

Procedural and structural attacks such as class blessing processs that are in topographic point to supervise teaching-research links,

Contractual/reward mechanisms that include wages constructions and inducements to promote staff to develop learning research links,

New policies and schemes to drive and develop embedding of research-teaching linkages,

Enhancing Graduate Properties by development of alumnus properties distinctive to HEI and the grade to which there exist possible synergisms with instruction and research linkages and

Disciplinary Cultures the extent to which civilizations within the HEI might further or suppress the development of effectual research-teaching linkages.

I will now depict, although it is non inclusive, how University of Abertay has gone about implanting resaerch-teaching linkages.

### **New policies and schemes**

New policies and schemes developed by University of Abertay Dundee include the White Space undertaking designed to rise consciousness of instruction, research and acquisition and aimed to reconstruct the whole University around some cardinal accomplishments: interdisciplinarity in reasearch and complex systems. Originating from White Space came a new instruction and acquisition program, a installation that promoted insouciant and non insouciant interactions amongst staff and pupils, squad working and exposure to interdisciplinary research ( Whitespace studentships ) . The Whitespace studentships are designed to guarantee existent originative thought across a scope of subjects.



## **Enhancing Graduate properties**

The University ' s work on alumnus properties has besides served to ordain the linkages between learning, research and learning schemes to breed alumnus properties. University of Abertay Dundee are working to polish a list of qualities that should be common to all alumnuss of the establishment, see Appendix A. The list contends that Abertay alumnuss should be four things: confident minds, determined Godheads, flexible confederates and ambitious inquirers. The terminal consequence should be that its pupils have the accomplishments to “ dispute complexness ” in whatever they go on to make when they graduate.

## **Get the better ofing Disciplinary civilizations**

In footings of disciplinary civilizations for some subjects particularly in the countries of difficult scientific disciplines it is hard to further learning research linkages before the 4th twelvemonth this is due to the cumulative and hierarchal building of cognition. Students need to hold the necessary background on constructs and rules before they can prosecute in research-based activities and are able to understand the consequences of research. This makes it hard to integrate research findings or one ' s ain research in undergraduate classs, in peculiar in the first two old ages ' ( Fasli, 2007 ) . Undertakings within the University of Abertay such as Project X, a first twelvemonth faculty, seeks to get the better of this.

In add-on to institutional drivers persons besides have a important consequence on teaching-research linkages which I will depict below.

## **Interventions – Individual Role in Teaching Research linkages.**

Below I will show and reflect upon several personal experiences in which I have tried to utilize research as a driver for learning with the purpose of heightening the pupil experience and to the deepness and comprehensiveness of pupil learning. In all my instruction I seek to further a research-mindedness in the pupils. I believe that pupils at any phase of their programme can be exposed to teaching-research linkages nevertheless the nature of the interaction must be appropriate for that degree and I have used the model developed based on Healey ( 2005b ) which has been exploited by Levy ( 2007 ) to steer this interaction ( Fig 1 ) .

### **Figure 1: Curriculum design and the research-teaching link from Healey ( 2005b, p. 70 ) .**

We can categorize the instruction activities used to heighten the teaching-research link based on the nature of the research procedure and the interaction with pupils. By and large there should be a move from research-led to research-based as pupils progress from degree 7 to level 11 of programme. The research-tutored manner reflects the authoritative tutorial construction where the pupils are taken through recent publications and invited to discuss/debate their apprehension of the activity. Research-led follows current research where pupils are exposed to concepts/developments in the field of survey. Research based corresponds to enquiry based acquisition. Students are given a undertaking which requires them to utilize and develop accomplishments ( pattern and apprehension ) which are tantamount to those used in reliable research. Finally Research-oriented purposes to learn the procedure of cognition building. Typically found in <https://assignbuster.com/case-study-reflections-on-teaching-education/>

finishing touch classes where pupils undertake some research activity, separately or as a group.

Students can be engaged with current research in their subject in a assortment of ways, including talks, academic staff-led seminars, practicals, pupil undertakings and class work. The illustrations below are based on personal experiences where I focus on schemes that attempt to set pupils in active manner as they encounter current research the Mathematical and Information Sciences.

## **1. MSc Computer Games Technology Project Execution ( research oriented )**

This research learning activity involves oversing a research led Masterss undertaking in the country of Computer Games Technology. The pupils are encouraged to believe every bit creatively as possible to place a research inquiry that they can research and develop in a finishing touch undertaking. At the beginning when developing the research inquiry I guide them to recent articles that have been published and that are aligned with their country of involvement. I besides guarantee that the Masterss pupils are cognizant of the on-going research work at the University which helps to contextualise their acquisition within ' real life ' undertakings. I besides give advice and support on the research procedure.

The UAD alumnus properties that may be developed include: A comprehensive apprehension of their primary field and its construction ; Informed by current developments in the country ; Initiating and pull offing

originative procedure and Working flexibly and efficaciously with ambiguity, uncertainty, and mistake.

## **2. MSc. in Interdisciplinary and Systems Approach to Environmental Challenges ( ISAEC ) ( research based )**

I am part of the programme squad of the new ISAEC programme that will run in 2011 and has been developed around three subjects.

Interdisciplinary and Systems Approach to Environmental Challenges.

The complex nature of the environment requires an interdisciplinary and systems approach to understanding modern-day environmental challenges. The ISAEC programme will present pupils to a broad scope of scientific subjects relevant to environmental scientific discipline, showing how they can unite to organize a better apprehension of jobs and take to fresh and practical solutions.

Fundamentals of Environmental Science.

Cardinal to understanding the environment is a strong apprehension of basic ecological rules, how scientific research should be undertaken and analysed, how procedures could be modelled, and how recent developments in engineering could be applied to understanding modern-day issues and the development of solutions. The ISAEC programme will present pupils to the rules of ecology, to research methods and techniques, statistics and modeling, and progress in engineering relevant to this interdisciplinary field.

Problem-Based Learning Approach.

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Rather than utilizing the traditional talks, the ISAEC programme will learn pupils through the problem-based acquisition attack where groups will set about extended and in-depth analyses of modern-day environmental challenges. This attack teaches autonomous research and group accomplishments, indispensable for running into future challenges long after accomplishments and information learnt at University may go out-of-date.

I have developed one of the survey undertakings based on recent research that I was involved in with Aitkens planetary who were commissioned by the UKWIR to look into direction options ( intercessions ) of Phosphate at H<sub>2</sub>O intervention works. The instance survey I have designed is based on current issues in environmental scientific discipline and addresses the three subjects above and is described below. This is how the job would be presented to the pupil squad who will work in groups to come up with a solution that they will show orally and in the signifier of a written study.

#### Study Project 4: Management OF PHOSPHORUS ACROSS SCOTTISH LANDSCAPES AND RIVER SYSTEMS

The deficiency of equal degrees of P in agricultural dirt bounds harvest growing and productiveness in many countries. The application of P has been traveling on for decennaries, and taint of land H<sub>2</sub>O, rivers, lakes, estuarine and coastal Waters is now recognised as a major environmental concern. Management of P within the environment is supplying a major challenge for regulators and industrial practitioners. Given regulative challenges, i. e. environmental quality criterions, it is indispensable that phosphoric life rhythm is reviewed and suggestions how P can be managed in the most cost

effectual manner to guarantee long term regulative conformity. The end product of this survey can be used to inform the Water Industry of how to pull off P in the long term. In the consideration of the direction of P across Scots landscapes and river systems, the survey undertaking will turn to the undermentioned areas/questions:

Principals of Ecology ( BN1101A ) : Impact of human activities on natural environments, pollution and sustainability. Ecological impact of P in rivers. Bio-solid intervention of P and returning it to the land.

Research Methods and Techniques ( BN1102A ) : What sort of sampling, study and/or monitoring is required to inform argument about the direction of phosphoric degrees in the environment? What sort of research lab or field experiments should be undertaken to back up the development of techniques to back up the direction phosphoric in the environment?

Modeling and Statistics ( BN1103A ) : Modeling the destiny of P in rivers with different beginnings for effectual ordinance.

Progresss in Technology ( BN1104A ) : How to supervise P in river systems. Use of bio-solids in H2O intervention workss. How to pass on and visualise the consequences to a scope of stakeholders including UKWIR.

The alumnus properties addressed in this teaching-research linkage activity are:

Interpreting and reacting to altering group kineticss ; Defining and developing single functions in squads of assorted formation and intent ; Enquiring and reflecting ; Abstracting, refinement, drive, and synthesizing ;  
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An ability to place the current boundaries of their capable field, a willingness to transgress them, and the cognition to work within the borders and Working flexibly and efficaciously with ambiguity, uncertainty, and mistake.

### **3. 3rd twelvemonth CGT 3D Graphics Programming Module ( Research – led )**

Applied 3D artworks is an active research country within the University of Abertay. A significant research country is developed and a figure of PhD studentships exist in this country which attracts regular visitants and seminar talkers and industrial spouses and plays host to national conferences. The undergraduates are really cognizant of this and it provides a context and stimulation for the thoughts explored in the faculty. Research done by SIMBIOS and White Space in footings of visualisation of complex systems is used to inform and update the application of the 3D graphical techniques described in the talks. Students are encouraged to go to seminars where appropriate and are kept informed of chances within the group. As portion of the appraisals the pupils are to develop a peculiar technique or consequence in 3D artworks. Students pick this based on a game screen shooting they like or a new technique that has merely been published in the SIGGRAPH or EuroViz diaries that I discuss in the talks. The alumnus attributes that may be developed by set abouting this activity include: A comprehensive apprehension of their primary field and its construction ; Initiating and pull offing originative procedure ; Abstracting, refinement, drive, and synthesizing ; Working flexibly and efficaciously with ambiguity, uncertainty, and mistake ; i?→ An consciousness of the

probationary nature of cognition, how cognition is created, advanced and renewed, and the exhilaration of altering cognition.

#### **4. Nuffield undertaking ( Research – oriented )**

During the summer I supervised a Nuffield pupil undertaking that was looking into the usage of an emerging engineering, augmented world, in Urban Planning. At the beginning of the 6 hebdomad undertakings I sat down with the pupil and we discussed my research involvements and the possible ends of the undertaking and we came up with several experiments that would be undertaken to measure if augmented world could be used in urban planning utilizing trade good hardware. Once all the hardware and package was set up the pupil worked through the experiments. Although the pupil was in 5th twelvemonth at school she felt portion of the research procedure as we jointly discussed and decided what experiments we would run. I felt this was an of import procedure in acquiring the pupil engaged with the research activity from the beginning. It must be noted nevertheless that I was a small unsure about this at the beginning as depending on the pupil ' s assurance this may hold been an daunting procedure but for this instance it worked good. Properties which may hold been developed include: Informed by current developments in the country ; An consciousness of the probationary nature of cognition, how cognition is created, advanced and renewed, and the exhilaration of altering cognition ; The ability to place and analyze jobs and issues to explicate, measure and use evidence-based solutions and statements and An ability to deploy techniques of analysis and question.

#### **5. Maestro categories in Mathematicss and Computing ( Research - led )**



For this 1 hr activity I try and stimulate the involvement of primary 7 and 1st twelvemonth students in Mathematicss and Computing. I do this by concentrating on real-world jobs that they can associate to i. e. how can we picture accurate gesture and motions of ' things ' in computing machine picture games? I use many ocular AIDSs and towards the terminal I describe some of the cardinal challenges that we need to turn to in the close hereafter and associate this to my current research and how this can assist in other Fieldss such as environmental scientific disciplines.

## **Decision**

There are many barriers to implanting learning and research within the course of study. I have highlighted what can be done at an institutional degree to relieve this issue and described three institutional intercessions employed by the University of Abertay including new policies, heightening alumnus properties and get the better ofing disciplinary civilizations. I have besides described what I have done at the single degree. In decision at the single degree I feel that I try and incorporate learning and research linkages at all degrees of my instruction. I evidently do this for the pupils rational development but it is necessary for me to be interested and excited by what I am learning and being cognizant of the latest developments is cardinal. Research-teaching linkages may be easier for me to develop as I am research active although it is non the measure of research that is associated with quality of instruction. For illustration a recent survey by Prosser et Al ( 2004 ) determined it is the overall conceptualization of your capable affair that is associated with quality of learning. " It is non how active you are as a research worker, but what your activity is focused on " . One unfavorable

judgment though is that I may not pass adequate credit doing the teaching-research linkages explicit to the pupils. From mapping my teaching-research activities to the quarter-circles of Fig 1 it appears that I do not set about research-tutored activities. I had not truly considered this manner of teaching-research activity before but it could be useful in a figure of contexts in which I teach. Given most of my instruction activity is at degree 9 and above I do not meet the known troubles associated with using teaching-research activities at degree 7 and 8 ( Fasli 2007 ) . However I acknowledge attempt is required to make a meaningful teaching-research relationship and work has to be done to do certain the nexus is expressed.