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a GAME-BASED LEARNING APPROACH to BUILDING CONSERVATION EDUCATION in UK UNDERGRADUATE BUILT ENVIRONMENT DEGREES

A thesis submitted in partial fulfilment of the requirements for the award of the degree of the Doctor of Philosophy of the University of Portsmouth. Portsmouth 20/08/2012
Declaration

Whilst registered as a candidate for the Doctor of Philosophy, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award.

Signed: ________________________________  (Candidate)

Date: _________________________________
Abstract

Across the globe, the historic (built) environment is counted among a country's most precious cultural commodities, which despite its popularity remains exceptionally vulnerable and in constant danger of deterioration and decay. Due to an unusually high density of historic structures in need of protection coupled with a strong property and construction sector, this issue is more prominent in the UK than in other developed country. Built environment professionals regularly encounter historic and protected structures in their professional practice and exhibit a general tendency towards principle support of the concept of conservation. Nonetheless, the heritage discourse and with it the discussion of architectural conservation principles, issues and implications in relation to other built environment professions is, by and large, woefully absent from formal professional education at the tertiary level.

This thesis investigated various forms of conservation education in respect to their nature and extent in the context of UK undergraduate built environment degrees in a mixed-methods research approach. The findings suggest that while practitioners as well as educationalists and building conservation specialists all agree to the importance of conservation to both cultural fabric and built environment sector, neither shows concrete tendencies to introduce the heritage discourse into (built environment) higher education on a wide scale. Conservationists prefer to focus their heritage appreciation programmes on young children, while practitioners and built environment educationalists claim building conservation education to be of little relevance to their professional education. In between, the average built environment student is released into professional practice woefully unprepared for encounters with historic, let alone protected structures.

This thesis proposes to include adult learners at tertiary level into the built heritage discourse on a much wider scale by suggesting the development of a
curriculum for novice conservation education and a subsequent Conservation Game as a custom-created digital teaching and learning tool building on the principles of experiential and game-based learning to be implemented in higher education institutions across the UK. Modelled on Dawid W. Shaffer's Epistemic Games, the theoretic and conceptional background behind the Conservation Game is laid out as an interactive and engaging simulation of conservation practice to introduce conservation novices to concept and practice in a risk-free, fun environment with the aim to increase baseline building conservation understanding and appreciation in young UK built environment practitioners.

**Key words:** Historic building conservation, awareness, conservation education, built environment education, game-based learning, experiential learning
Acknowledgements

In many ways, a PhD research is not unlike a fantasy game - the young mage sets out on a long and perilous journey to gain the knowledge of the elders and slay the dragon. The quest, so enthusiastically begun, before long turns dark, and in the search for clues the young hero must navigate steep mountains, scorching deserts and seemingly impassable marshes full of ghost lights trying to lead her off the right path. Along the way, she encounters knowledgeable elders and kind strangers, some becoming close friends, and it is because of their guidance and support as much as her own prowess that the hero can endure all hardship and prevail in her quest. It is to them, the friends, family and kind strangers which are owed the warmest of thanks, that these pages are dedicated:

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*Achievement unlocked: Elder Knowledge*  

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1 Elder Knowledge achievement badge from *The Elder Scrolls V: Skyrim*, (Bethesda, 2011)
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## Aims & Objectives

## Document structure

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- Building Conservation in the 21st Century
- Contemporary building conservation practice (UK)
- Building conservation education
- Learning theories in built environment education
- Experiential learning and related concepts
- Praxis
  - Reflective practice
  - Competency
  - Adult education
- New learning for new learners?
- Interactive practice: Towards a 21st century education
- New media use in built environment education
- What is a game?
- (Digital) Games in Learning
  - Role-play
- Epistemic Games – Towards a Pedagogical Praxis

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## Abbreviations *

- **ABE** Association of Building Engineers
- **CABE** Commission for Architecture and the Built Environment  
  (now integrated in the Design Council)
- **CG** within the thesis: Conservation Game  
  (in general terms more commonly used for Computer Graphics)
- **CIOB** Chartered Institute Of Building
- **CPD** Continuing Professional Development
- **DCMS** Department for Culture, Media and Sport (UK government)
- **DGBL** Digital Game-Based Learning
- **EH** English Heritage  
  (also: The Historic Buildings and Monuments Commission for England)
- **GBC** Gosport Borough Council
- **HCC** Hampshire County Council
- **HE** Higher Education
- **HEI** Higher Education Institution
- **HLF** Heritage Lottery Fund
- **ICOMOS** International Council on Monuments and Sites
- **IHBC** Institute of Historic Building Conservation
- **NPC** Non-player character
- **NVQ** National Vocational Qualification
- **QAA** Quality Assurance Agency
- **RIBA** Royal Institution of British Architects
- **RICS** Royal Institution of Chartered Surveyors
- **RTPI** Royal Town Planning Institute
- **SPAB** Society for the Protection of Ancient Buildings
- **UCAS** University and Colleges Admission Service

* for a more comprehensive depiction of the most relevant terms see thesis glossary in Appendix A
This image (Figure 1), allegedly taken of a redevelopment site in Bristol (UK) and posted in 2005 on an online discussion board, perfectly sets the scene for the difficulties and controversies surrounding contemporary building conservation practice. In the space of an ordinary text message, it illustrates the struggle of the past against the future, and vice versa, against the backdrop of capitalism and economic development on the stage of the (in this case, British) built environment. It plainly typifies a perception of obsolescence towards the remnants of “yesterday”, an obstacle to be removed to enable progress. In contrast, the author of the post on said discussion board clearly envisaged progress for progress’s sake as a great evil. ‘Absolutely everything about this upsets and depresses me in a genuinely tangible way’, he or she states, and then goes on to say ‘I want to cry’ (lazyhour, 2005).

Architectural or building conservation in its recognisable modern form has always been controversial. In its tireless quest to preserve that which at times has clearly expired its practical use, building conservation is regarded by some as the obsolete
millstone around the neck of economic and cultural progress. Building conservation is expensive in its demands for specific materials, construction methods or craftspeople, not to mention the frequent delays in planning processes due to the necessity of considering specific conservation planning legislation. In the light of all objects' and structures' inherent natural course towards decay, the compulsive quest to halt and even reverse said course is an unnatural endeavour. In apparent defiance of natural laws and fiscal sense, architectural conservation nonetheless enjoys as dedicated and passionate a followership than natural conservation (albeit somewhat less activist). Supporters call it a cultural investment, but it is an investment of such magnitude that a society, a state, can only truly consider and support it when all other, more life-essential spending has been covered. In many ways, the past becomes increasingly relevant the less life-threatening the future is. As such, building conservation is both a luxury good for the well-to-do (individuals and societies) to indulge in, and a threatened commodity in constant danger of being de-prioritised in favour of a wide variety of aspects of economic and cultural life deemed more important.

This thesis represents an essay in full support of the protection of the historic (built) environment which undoubtedly belongs to a country's most precious cultural commodities (Clark, 2006). As mentioned above, the author is not alone in this appreciation and support, which at least in the developed world is widespread and deeply ingrained in public opinion. To hardly a country does this apply as much as the UK, where with an estimated half million buildings and over 9000 conservation areas under statutory protection (Doggett & Eydmann, 2007), the historic built environment really does touch everybody’s life in one way or another, reflecting the nation’s uniquely strong link to its built heritage. This thesis focuses primarily on the UK based to this unique specification, which is exemplified in the following comparison: Austria, another European country with rich cultural history, one can find one listed (i.e. statutorily protected) building for approximately every 614 citizens, or respectively one per 6 km$^2$. In comparison, the UK sports one listed building per 124 citizens, or 12 per 6 km$^2$, illustrating the astonishing density of built
heritage under statutory protection\(^2\). This density further serves to indicate a broad principal support of heritage conservation by the tax-paying population, on which conservation is heavily dependent. A survey conducted by English Heritage, the Government’s official heritage advisor, in 2000 revealed that 87% of respondents agreed with publicly funded support for heritage conservation, while 77% did not believe that too many objects were being protected (Clark, 2001, p. 64).

The above density of traditionally constructed, protected structures testifies to the omnipresence of the historic built environment in general and its humbler examples in particular. This presence penetrates settlements to such an extent that the existence of the physical representatives of our historic built environment, and here mainly its humble forms, could easily be taken for granted. While one is tempted to think of a historic building as an edifice of grandeur and wealth such as a castle, cathedral or manor house, which admittedly play a significant part in the popularisation of cultural heritage, it is in truth down to the modest, everyday structures to truly define the character of a town or city. This modest heritage of Medieval or Georgian town houses, Victorian terraces and industrial estates, which in the 1970s and 80s used to be commonly expressed in the well-known government phrase as the 'familiar and cherished local scene' (Mynors, 2006, p. 4) penetrates common consciousness and fosters feelings of identity, pride and well-being through continuity, familiarity and quality (Graham, Ashworth & Tunbridge, 2000, p. 2). On a smaller, more personal scale, modest heritage is as important for local communities as the grand, iconic heritage is for a city or nation and its significance has been formally acknowledged in the Government’s Statement on the Historic Environment for England 2010 (Department for Culture, Media and Sport, 2010, p. 5).

The erosion of historic fabric from cities, towns and countryside alike in the course of refurbishment, redevelopment and regeneration happens easily and quietly. While proposed changes to individual buildings under statutory protection require strict consent and are thus being closely regulated and monitored in order to

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\(^2\) As these figures can only be roughly approximated, they serve to illustrate the comparatively high proportion of the UK’s listed buildings but are not to be regarded as statistic data.
comply with statutory directions and preserve the special character of a building, the risk of loss of character to the less rigorously protected conservation areas or unprotected other traditional building stock is much more imminent. Yet even though these neighbourhoods are popular and well loved urban spaces (Hammerson & Sangster, 2004), their status is under large threat by a gradual erosion of sympathetic features (Figure 2), particularly in areas where individual structures do not meet statutory listing requirements, but rather derive their special character from their contribution towards the overall character of the neighbourhood. Many of the issues in question, such as unsympathetic window/door replacements or poor road and open space maintenance, are the result of minor, gradual and individual changes which nevertheless have a significant cumulative impact on the quality and integrity of the historic environment, which in turn can lead to a drastic devaluation both in terms of property prices but also aesthetic and community values (English Heritage, 2009a; 2009b).

Figure 2a & b: Decay of original brick and stonework due to unsympathetic use of repointing materials

In the 2010 Government’s Statement on the Historic Environment for England, the government recognised the potential impact of every single house owner, developer and planner on the historic environment in formulating the aspiration ‘that the value of the historic environment is recognised by all who have the power to shape it’ (DCMS, 2001, p. 1). According to Kate Clark (2001, p. 63), around a third of all planning applications per year potentially impact the built heritage. The author thus considers it vital for home owners, but particularly for built environment professionals to be aware of the potential impact of their decisions on the nation’s
built heritage, and to develop a conscious appreciation of the same in order to secure its continuous existence and sustainably enhance its quality and value for the benefit of present and future generations.

Considering the ramifications of uninformed development in and around the historic built environment, particularly in the light of calls for sustainable regeneration, it is remarkable that a sensible topic like residential building conservation hardly ever appears on the curricula of undergraduate built environment courses throughout UK’s Higher Education Institutions (see Chapter 4, p. 117). Prospective built environment practitioners can leave university with a degree and enter the free market economy at times without their education ever having touched upon conservation issues. As these students are bound to actively shape the face of Britain’s built environment in the future, it seems self-evident that at least a threshold-level knowledge and understanding of the historic built environment and its protection should be a cornerstone of any built environment professional’s formal education. However, one would be mistaken in assuming this to be universally the case.

**Aims & Objectives**

As indicated above, the background motivation of this research lies in the medium- to long-term improvement of the day to day care for the UK’s historic built environment at the hands of general built environment practitioners. This thesis aims to map and raise awareness of the conservation education deficits in general built environment education, improve existing conservation awareness building through development of an education proposal and consequently contribute to the long-term protection and survival of the historic built environment.

To this effect, the author believes in the value of integrating the (built) heritage discourse into built environment curricula in British higher education more firmly than it is the case up to this point through the development of a model conservation curriculum. In order to facilitate nationwide dissemination of such contents while
increasing the motivational appeal of studying architectural conservation, the development of a game-based delivery system is proposed. Thus, the central research question mapped out in this thesis has been formulated as follows:

**To discover how to adapt essential conservation baseline contents in an interactive, playful, problem-based learning environment flexible enough to be adoptable by higher education institutions (HEIs) across the UK in order to teach real-life relevant conservation appreciation and (project) management skills;**

As this document will demonstrate, the streamlining of conservation contents and discourses into a nationally adoptable programme has not been attempted before - neither has the adaptation of said contents in an educational, digital game environment. As such, very little experience value has been committed to writing in this particular intersection of building conservation, built environment education and educational games. This thesis is therefore predominantly explorative rather than determinant in nature and as such does not rely heavily on the testing of hypotheses. Instead, the research presented in this document focuses primarily on the establishment of baseline knowledge about building conservation (education) practice, built environment education, general applicable learning theories and educational games, and the reconciliation of the respective results into a delivery system proposal. The objectives of the various research phases were therefore designed to:

- explore and determine the status quo of building conservation practice and built environment education as evident from academic literature
- explore key learning theories commonly employed in built environment education and to determine their applicability for a game-based learning environment
- research successful game-based learning applications for complex learning and determine a suitable model for the development of a Conservation Game
• investigate the nature and extent of specialist building conservation courses irrespective of degree status
• investigate the nature and extent of building conservation education as part of general undergraduate built environment degrees at UK higher education institutions
• gather attitudes and opinions on building conservation education as part of undergraduate built environment degrees in a series of interviews
• investigate and determine statutory, educational and professional practice standards for adaptation in a national curriculum
• develop standardised learning outcomes for said national curriculum based on the above gathered information and personal teaching experience
• reconcile all above data into a baseline proposal for the development of a Conservation Game

DOCUMENT STRUCTURE

The situating of this project at the intersection of building conservation theory and practice and built environment higher education and the particular proposal of a game-based learning and teaching application necessitates a three-tiered approach to the evaluation and review of relevant academic background concepts and theories. The first tier constitutes the intellectual homeland of this thesis and encompasses general architectural conservation theories and the more specific application of the same in UK built environment practice. The second tier investigates education practices and learning theories connected to above conservation and researches and evaluates the use of contemporary digital media as part of these practices. The third, final and most specific tier looks at the practical and potential application of game-based learning scenarios to built environment education practice and reviews a highly promising example of an educational game model based on professional practice. As such, the first tier aims to determine the status quo of contemporary building conservation as a general knowledge foundation for this thesis. The second tier establishes an understanding of the most prevalent learning theories in built environment education as a basis for the development of a
conservation curriculum (as seen in Chapter 6). The third tier then establishes a plausible model for the proposal of adapting building conservation contents into a game-based learning environment, based on the knowledge and understanding gained from the previous tiers.

Due to the above multidisciplinary approach and the consequently varied nature of the readers’ backgrounds and specialisations, Chapter 2 gives a comprehensive over- and review of the concepts and theories most relevant to this research project for each of the above outlined tiers.

Section 2.1 represents the first tier or knowledge cluster, introducing the reader to a general discourse of heritage and heritage values and outlining the importance of architectural conservation on both economic and social levels. The establishment of this theoretic foundation leads over to a more practice-oriented discussion and review of current building conservation practice in the UK, its respective statutory constraints and their implications for practical implementation within the UK planning system. In order to lead over to the second tier, this section also briefly discusses contemporary building conservation education as evident from the literature.

Section 2.2 reviews built environment education in general from both global and UK examples and outlines the strong presence of experiential learning and practice-oriented approaches in the academic built environment education discourse. It further investigates increasing counts of interactive and simulative learning and teaching applications in this context and discusses the concept of a 21st century education for "new" learners as frequently postulated in contemporary GBL (game-based learning) discourse.

Section 2.3 introduces the fundamental principles of games and game-based learning and illustrates how contemporary explorable simulative game worlds lend themselves well to the provision of meaningful learning scenarios which inherently motivate players to engage more fully in interactive environments than they would in traditional classroom settings. It then reviews in detail one of the most promising game-based content delivery systems (consisting of solid theory, tested practical
implementation and suitable assessment structure) for complex and practice-oriented learning currently under development, the concept of Epistemic Games by D. W. Shaffer (see section 2.3.1, p. 70), as a basis for the development of the Conservation Game in Chapter 6.

Chapter 3 re-introduces the research question and outlines the theoretical background of the employed mixed methods approach, which was chosen due to the complexity of the investigated subject areas and the multifaceted nature of the built environment sector. The nature and justification of the employment of above mixed methods approach and its respective research tools are discussed, while the final section offers a statement on the author's academic and intellectual background in accordance with suggestions made by Steineke (2004) for a transparent approach to mixed methods research.

Chapter 4 illustrates the four research tools employed in the primary data collection process - inventory, survey, interviews and teaching practice. Beginning with the listing of specialist building conservation courses provided within and beyond higher education, the chapter then explores the various aspects of building conservation education in regards to its actual and potential application in UK built environment undergraduate degrees. A drawn-up inventory of existing built environment degrees provides the basis for a survey targeted at built environment course leaders to discover the nature and extent of conservation education as part of their respective courses. Following on the survey results, a series of interviews with representatives from universities, professional bodies and practitioners within the built environment sector is presented. In addition, Chapter 4 outlines and evaluates the author’s experiences from lecturing a conservation-based unit as part of a property-focussed degree at the University of Portsmouth. Each research tool is presented, explained and detailed separately and a brief evaluation of the respective results is offered for each of the outlined tools.
Chapter 5 draws on the findings and concepts presented in Chapter 2 and synthesises them with the results from each of the individual research tools in Chapter 4 to present, interpret and evaluate the key results of the data collection phase. In this chapter the findings are presented by topic rather than research tool to allow for the assimilation of all relevant data into recurring themes irrespective of source and origin within the research process. This chapter argues a clear, evidence-based case for the inconsistency or downright absence of building conservation education in formal built environment education pathways and the necessity of its implementation.

Drawing on the data gained from the research process and conservation as well as GBL background concepts incorporated from the literature, Chapter 6 outlines a detailed theoretical background structure of a model conservation novice curriculum and its potential application in a Conservation Game aimed at ameliorating the above lack of dedicated conservation education. A framework for the assurance of high quality is developed from a range of professional and academic standards (national and international) and presented alongside the author's proposal of suitable learning outcomes for above curriculum and game. Chapter 6 further contains a description of the proposed game's nature and structure and presents considerations such as game play mechanics, enjoyment features, triggers for learning and assessment strategies based on findings from best practice approaches in game design and game-based learning, notably Epistemic Games. The final section of Chapter 6 outlines general considerations for the Conservation Game in regards to development and release.

Chapter 7 offers the author's conclusions and final considerations as well as a number of reflections on the research process and game proposal. This chapter further contains an explicit discussion of the contributions of this research to academic knowledge as well as a review and discussion of the thesis' limitations and closes with suggestions for future work.
As outlined in the previous chapter, this thesis aims to reconcile the three research areas of building conservation, built environment education and game-based learning in a multidisciplinary research project in order to propose a digital learning tool to widen and enhance baseline building conservation education across the United Kingdom. Central to this project therefore lies a strong concern for the historic built environment and its appreciation, promotion, protection and conservation on a wider scale, both globally and in the UK. The project however focuses exclusively on the UK due to the previously mentioned specific constellation of a dominant property market, an extraordinary number of buildings under statutory protection and a general lack of conservation education for built environment professionals on a higher education level. It is in the project’s decided interest to address this lack and propose a concept to ameliorate the level of general conservation awareness and appreciation through the employment of contemporary digital technology. While the full nature of the conservation industry and education apparatus will be appraised in Chapters 3 to 5, the following sections will introduce the reader to the prevalent discussions in the fields of contemporary conservation, conservation education, learning and new media/game-based learning.

The convening topic areas of heritage protection/building conservation, education and game research each trail a considerable apparatus of academic literature, and in combining the three to one study, one may only touch on the most prevalent features of each, and here only those that are directly relevant to the other two disciplines. Despite at times being confined to the introduction of concepts rather than a blow-by-blow analysis by the challenges of integrating multiple academic disciplines, the following appraisal of literature and secondary material constitutes an inclusive and comprehensive review of each topic in relevance to the thesis. In addition, an in-depth discussion of the main focal points of this thesis is provided in the sections on contemporary built environment education approaches and philosophy (p. 34) and the learning game model of
Epistemic Games (p. 70) adopted for the proposal of the Conservation Game in Chapter 6.

In compiling this review, the author has drawn on a wide variety of secondary materials including academic publications, a number of legislative texts and statutory guidance papers, public as well as internal research and reports by organisations in the built environment sector and numerous online sources such as e-journals and official websites. Building conservation is an interesting phenomenon in that it operates both on a highly philosophical, theoretical level but at the same time perforce targets all philosophical debate and its resulting policies towards actual practical application. Information may thus be derived from many different sources, many of them open-access sources. It must also be taken into consideration that as the internet has become the largest, most prominent and most accessible provider of information ever available to research (Tapscott & Williams, 2010, p. 18), many sources are only available online (particularly in the relatively new field of learning in connection with digital media), rendering a contemporary reference list different to what it would have looked like but a few years ago. While the internet still hosts a vast amount of content of varying reliability, the general quality of serious web-based information is increasing constantly, to a point where an MIT journal article can now make repeated reference to the peer-reviewed database Wikipedia (see Shaffer et al., 2009), which due to a now huge base of serious contributors (“wisdom of the crowd”) is increasingly losing the stigma of unprofessionalism which it has borne since its conception in 2001 (http://en.wikipedia.org/wiki/Wikipedia).
2.1 Building Conservation in the 21st Century

The image of the redevelopment poster (Figure 1, p. 1) introduced some of the tensions and controversies surrounding architectural conservation, which occur globally but are particularly pronounced in the UK due to the above discussed density of built heritage under statutory protection. Grossly simplified, building conservation matters are matters of (contrasting) opinion, frequently pitched against each other in a battle of sense and sensibility, of economic gain and emotional attachment. Often, built environment practitioners are, unwillingly and unpreparedly, caught up in these conflicts. The author sees the promotion of mutual understanding as one of the keys to a more sustainable relationship between heritage conservation and the construction industry, an understanding which should be grown early in a practitioner’s professional development.

Unashamedly backing building conservation ideals, this first part of Chapter 2 explores the intellectual homeland of this research project by illustrating the philosophical motivations behind heritage conservation, its popular support and contemporary practical application in the United Kingdom with a specific focus on the historic built environment. The second part (p. 34) investigates the prevalent learning theories relevant to built environment education with a focus on higher education and discussions around new media learning and adult education. The third and final section looks at the (potential) implication of these theories in game-based learning environments and their relevance for interactive built environment education and here more specifically, the promotion of architectural conservation. The final section also reviews Epistemic Games as a plausible digital game system on which to base the Conservation Game as outlined in Chapter 6 (p. 178).
2.1.1 BUILDING CONSERVATION – philosophical background

HERITAGE

One cannot discuss building conservation without dipping into the domain of heritage with topics like a society’s perception of the past and the values attached to, and associated with, historic remnants. Despite a multitude of applications, the term heritage seems to lack a single definition universally accepted in academic literature (Ashworth & Graham, 1997, p. 381; Pocock, 1997, p. 260). Heritage is too big a concept, too culturally diversified and too varied in its manifestations to be able to find a single global definition. In explaining its complexities, Carreira cites a popular Indian story in which six blind men try to describe an elephant solely based on the part of the animal they came in touch with (2004, p. 1), resulting in a multitude of accurate but fragmented views which only when integrated gave a full description of an elephant. Indeed the word heritage seems to have become such an intrinsic part of common knowledge that irrespective of its broad use, a definition is often omitted. In any case, heritage indicates a large apparatus of meanings that can vary strongly according to context. It may among other manifestations signify positive associations such as reassurance against existential fears (Jedlowski, 2001, p. 38), negative connotations such as an indication of obsolescence (Kirshenblatt-Gimblett, 1995, p. 371), or a major contributor to economies through marketing and tourism (Ashworth & Graham, 1997, p. 381).

In the United Kingdom, the Department for Culture, Media and Sport (DCMS), which acts as a patron of the historic environment, speaks of heritage as ‘properties and artefacts of cultural importance handed down from the past’ (n.d.) and further mentions a joint responsibility to conserve national heritage for future generations. In this statement, two significant characteristics of heritage are outlined: the specification of remnants of the past, and the wish to conserve them.

Most commonly the concept of heritage encompasses a notion of the past, as the term itself indicates a handing down of personal, common or intellectual
property through time through the process of inheriting, be it by a single person, group or society as a whole. Thus, in very simple terms, heritage is what is left of the past – this aspect is most readily agreed upon. Yet in the same capacity inheriting also implies items which are yet to be inherited, therefore containing the concept of future heritage (Howard, 2003, p. 6). Additionally, as seen in the DCMS statement and seconded by English Heritage (EH) (2008, p. 13) as well as graphically illustrated by the work of heritage organisations such as EH, the National Trust, Heritage Link and countless others, the term implies a desire for protecting the remnants of the past for future generations, indicating the association of strong personal and interpersonal values.

Generally, heritage and with it the historic built environment is commonly linked with various ideas of value or interest – a statement graphically underpinned by Figure 1 (p. 1). The Compact Oxford English Dictionary’s definition designates heritage as something valued which once again is deemed worthy of protection and preservation (Heritage, 2008). The roles of values in connection with heritage are discussed more deeply on the following pages. Lowenthal (1985, p. xvi; 1998), Fowler (1992, p. 4-5) and Howard (2003, p. 6) agree that the attribution of value to items of historic interest, often simply called artefacts, is ultimately one of the key defining aspects of heritage, a notion that the author as well as the academic community very much agree with. Any given object or aspect of life has the potential to become heritage through designation and the attribution of special value. In this process, the designation does not necessarily have to take place as a conscious act – even items that are now perceived as heritage purely because of their age must at some point have gone through an allocation of value which allowed the item to survive.

Through the designation of value and the interpretation of evidence, a contemporary view of the past is created, with contemporary being a key aspect. When distinguishing visuality from vision, Bryson argues that visuality constitutes vision seen through a form of cultural screen which holds all cultural discourse
Thus the image captured by the eye (vision) is effectively mediated and interpreted by that screen according to cultural norm. Reading the remnants of the past functions very similarly in that interpretation is invariably influenced by contemporary cultural perceptions and expectations, thus becoming a contemporary construct. Along these lines, Kirshenblatt-Gimblett argues that the heritage industry is a ‘new mode of cultural production’ in which aspects of the past are given a second life as ‘exhibits of themselves’ and are produced, much like one would stage a play, not as the past but as ‘something new in the present that has recourse to the past’ (1995, p. 370). This echoes Lowenthal’s thought that ‘a heritage wholly saved or authentically reproduced is no less transformed than one deliberately manipulated’ (1985, p. xviii). The issue of authenticity in the face of representation and reproduction has been famously addressed in Walter Benjamin’s 1936 essay *The Work of Art in the Age of Mechanical Reproduction*. Benjamin argues that no matter how perfect a reproduction, full authenticity can never be achieved because ‘its presence in time and space, its unique existence at the place where it happens to be’ (1969, p. 220) are exclusive to the original work of art, or in the context of this thesis, a historic structure. On a theoretical level, such considerations are particularly relevant in the light of a research project which deals with digital imagery (as discussed on p. 64).

VALUES

As previously indicated, the debate around value is central to both the concept and the administration of heritage. The attribution of value creates heritage, yet as it is a social construct, the association of values with heritage will differ between social groups, and even from individual to individual - the nature of these values may vary considerably. At the same time, the continuing attribution of value to heritage is paramount to making provisions for its safekeeping in the future. This section will briefly discuss the main values associated with heritage in general and the historic built environment in particular.
Christina Cameron (2006, p. 71) argues that historic buildings as a sub-group of heritage artefacts are not inherently valuable, but become so because people ascribe values to them – a phenomenon Kirshenblatt-Gimblett likens to value-added economy (1995, p. 370). These statements underline the ambiguity of values attached to heritage through their dependence on the perspective of the beholder – much like Bryson’s previously mentioned cultural screen. Cameron goes on to quote Hamlet, remarking that ‘there is nothing either good or bad but thinking makes it so’ (2006, p. 72), a fitting quote for what may be regarded as a rather metaphysical debate. If heritage is thus dependant on individual and cultural interpretation, this logically implies that as attributed values are products of contemporary intellectual and cultural climates, they are subject to change over time. Similarly, different cultural circles will offer different interpretations and attribute different values. Gibson and Pendlebury argue that it is nowadays a ‘contemporary imperative’ (2009, p. 1) to consider all forms of value as equal – a reasonable and valid statement in the light of multi-cultural and multi-faith interaction in the “global village”. Yet at the same time the reality of conservation necessitates prioritisation, which perforce leads to some values being given preference over others (Kerr, 2000, p. 3). This debate attests to some of the difficulties faced by contemporary heritage and building conservation (more issues are discussed in section 2.1.2, p. 23) and outlines important considerations for the design of the Conservation Game.

In general, all strands of value are commonly discussed under the umbrella term cultural significance as laid out by the Burra Charter, which Hall and McArthur and group into economic, socio-cultural, scientific and political dimensions (1996, p. 6). While these groupings are suitable for in-depth discussions about heritage values, they are somewhat too elaborate for the scope of this thesis, which groups heritage values more roughly into cultural and economic values. While economic value is

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3 The Burra Charter: formally The Australia ICOMOS Charter for Places of Cultural Significance; originally published in 1979 and last updated in 1999, this charter sets out the best practice standard for the management of cultural heritage in Australia, although it continues to influence heritage management policies globally (http://australia.icomos.org/publications/charters/)

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frequently the more dominant factor in a capitalist society, in order for heritage to be judged inclusively, Throsby justifiably argues that ‘it is essential that cultural value be admitted alongside economic value in the consideration of the overall value of cultural goods and services’ (2001, p. 41).

Cultural values of heritage artefacts in general and historic built structures in particular encompass what could be argued as the idealistic part of the range of values. In the English Heritage Conservation Principles (2008) document for the UK, four key heritage values are outlined, all of which fall into the spectrum of cultural values: Evidential value, the physical evidence of life in the past; Historical value, an artefact’s power to connect to historic events and/or persons; Aesthetic value; and Communal value, the meanings of a place to people who relate to it (EH, 2008, pp 28-31). The values described in the Burra Charter largely echo those adopted by English Heritage, with the exception of scientific value, which describes ‘the importance of the data involved, [...] its rarity, quality or representativeness, and [...] the degree to which the place may contribute further substantial information’ (Guidelines to the Burra Charter, 1988, p. 12). To this list, Throsby adds spiritual value, symbolic value and authenticity value, which refers to a site’s uniqueness (2001, pp. 84-85). Although these examples cannot be seen as an exclusive list of cultural values, they nevertheless encompass the most prominent cultural values, which by and large represent the foundation of national and international heritage protection policy and legislation.

The close relationship of economic values to heritage in general and the historic built environment in particular is demonstrated in the frequent use of terms such as heritage assets and/or cultural capital⁴. These terms graphically suggest the potential of heritage as an economic good and its capacity for considerable financial contribution to a given economy. Heritage-related tourism is estimated to contribute around £20bn to the UK’s annual GDP (The Heritage Lottery Fund, 2010,  

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⁴ Cultural capital: first coined by Bourdieu (1986), who used it to describe the relationship between social privilege and academic success at school (Kingston, 2001, p. 88), the term is nowadays broadly used to indicate the economic function of cultural assets such as heritage (Throsby, 1999, pp. 5-7)
p. 9), while the value of listed or designated historic properties has been shown to equal and in many cases exceed that of other properties both in the UK (EH estate agent survey, 2009) and Canada (Shipley, 2000). On a semantic level however, the word asset inherently signifies a readiness for exploitation, which by definition runs in opposition to the endeavours of preservation and conservation. Given the physical vulnerability of heritage artefacts, it is therefore imperative to consider the resilience of each resource, or asset, to any current or potential use (see also Carter & Bramley, 2002, p. 177). Any building conservation promotion campaign (as indeed proposed through the Conservation Game) must consider both groups of values equally not merely for the sake of inclusivity, but also in order to provide different points of entry to the heritage debate for people from different ideological backgrounds (as discussed further in Chapter 5, p. 164).

Financial, social or political benefits are frequently deciding factors in the protection and rehabilitation of the built heritage, but are yet, through the process of heritage designation, determined by the cultural values mentioned above. And although it may be a desirable outcome, the conservation of heritage does not necessarily have to be financially viable, as heritage is one of the few economic goods taxpayers are prepared to pay for without necessarily reaping personal benefit (i.e. being able to visit, etc.) (eftec, 2005, p. 2). This popular support, as discussed in more detail in the next section (p. 20), is invaluable for the historic environment, as its protection is a resource-intensive endeavour, which constantly runs the risk of rendering heritage conservation an unaffordable luxury good.

Within the tension field of heritage designation and values, one has to briefly consider the ramifications of social power structures on heritage, and vice versa. True to the common understanding that history is written by the victors, heritage (through the process of value attribution and designation) is generally “written” or determined by a social, political, religious or intellectual elite. Historically, heritage designation has been used to justify claims to power through association with certain historic aspects and deliberate disassociation with others (Graham,
Ashworth & Tunbridge, 2000, p. 34). The internationally televised destruction of the Buddha statues of Bamiyan by the Taliban in March 2001 can be seen as such an act of disassociation as well as a display of power. Alternatively, the reconstruction of the Frauenkirche (the Church of our Lady) in Dresden, Germany, has been termed ‘restorative nostalgia’ (Boym, 2001, p. 41) – an attempt to undo the past (James, 2006). Power thus creates heritage and is at the same time fed and defined by it, both on a cultural as well as an economic level. The ever-growing influence of the public on those in power however may begin to tip the scales in favour of a much more democratic approach to conservation, as exemplified by the Tancred Road refurbishment project in Liverpool, where public opinion and subsequent local campaigning averted the demolition of a degenerate neighbourhood (Tancred Road and Skerries Street, n.d.).

**Built heritage impact and popular support**

As previously mentioned in the section on heritage and values, the evidentiary quality of the historic built environment provides links to the concepts of familiarity and identity. Similar to other heritage artefacts, the historic built environment offers visible proof of the existence of the past, helping an individual to position him/herself in a time continuum. On a larger scale, this identification of a shared heritage fosters feelings of unity and pride within a society and relates closely with the concept of collective memory, which according to Jedlowski ‘tends to be understood as a set of “social representations concerning the past” which each group produces, institutionalizes, guards and transmits through the interaction of its members’ (2001, p. 33).

Many authors (Goulding, 2009; Graham, Ashworth & Tunbridge, 2000; Harrison, 2002; James, 2006; Lowenthal, 1985) speak eloquently of the importance of historic (built) environments for the creation of personal and cultural identity. Laing (*et al*, 2004) counts history and heritage, together with utility and culture, among the ‘sacred cows’ of town planning ‘against which any change [to an area or town] is likely to be measured’ (p. 14). However, despite the obvious attraction of historic
places, little research has been done to investigate the psychological reasons behind people’s strong emotional connection to their historic environments. Jane Grenville, building on Anthony Giddens’ work on ontological security\(^5\) (1990; 1991), argues that the familiarity and continuity associated with the built environment significantly contributes to ontological security, a notion the author supports. While her work has to be regarded as largely speculative, her argument ties in with other work on existential concerns caused by the constant acceleration of individual and social life after the industrial revolution and a largely future-oriented society.

‘[Modernity] is typified by a constant crisis of traditions [...] the continuity of social life is constantly under question’ (Jedlowski, 2001, p. 38). This disconnection with the past through a departure from tradition and historic memory has been formulated in the concept of cultural amnesia. Nostalgia\(^6\), a commonly pejorative term describing a sentimental, utter longing for a hopelessly glorified past, is presented as a ‘form of reaction to the velocity and vertigo of modern temporality’ (Pickering & Keightley, 2006, pp. 922-23) and is seen as the antithesis to cultural amnesia. Along similar lines, Routledge, Arndt, Sedikides and Wildschut discuss the terror-management function of nostalgia in people faced with death (2006, p. 132). While nostalgia can be linked to another term with mainly negative associations widely shunned by academia, kitsch, Atkinson argues that even cheap and obvious representations of familiar (historic) themes in architecture are popular because they provide ‘simple, ready comfort’ in their aesthetics (Atkinson, 2007, p. 537). It might thus be reasoned that the aesthetics of historic structures, in addition to their evidentiary value, provide a public safety net against the subconscious fears expressed in existential philosophy.

Theory aside, it is unquestionable that heritage in general and the historic built environment in particular enjoy great popularity. A poll conducted in 2000 on behalf

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\(^5\) ‘Ontological security’: ‘the confidence that most human beings have in the continuity of their self-identity and the constancy of the surrounding social and material environments of action’ (Giddens, 1990, p. 92)

\(^6\) ‘Nostalgia’: from Greek nostos (going home) and algos (suffering, grief) (Lowenthal, 1985, p. 10)
of English Heritage suggested the British population attributes significant value to the historic environment (EH, 2000, p. 4):

- 98% of people believe it’s a vital education asset
- 87% think that public funding should go towards preserving it
- 85% believe it’s an important factor for regeneration of towns and cities
- 77% disagree that too much is protected

A further survey in 2010 found that the historic environment considerably impacts decisions on where to work, live and visit (see Figure 3). It determined that 91% of visits, 74% decisions on where to live and 68% of workplace decisions in the UK are being influenced by the historic environment (Amion Consulting, 2010, p. 65).

![Figure 3: Importance of the historic environment in deciding where to live, work and visit (UK)](Amion Consulting, 2010, p. 65)

This reflects a general trend in property and real estate to specifically market period features of a traditional building, value buildings in conservation areas higher than equivalent buildings located elsewhere (EH, 2009a), set up specific platforms to aid in the search and acquisition of a historic property [http://www.periodproperty.co.uk/](http://www.periodproperty.co.uk/) or form groups such as the Listed Property Owners Club [http://lpoc.co.uk/](http://lpoc.co.uk/). A report for the Commission for Architecture and the Built Environment (CABE) into resident satisfaction with homes in 2009 found
that over 60% of respondents rated ‘period character’ as an important feature of a residential property (Drury, 2009, p. 4).

2.1.2 CONTEMPORARY BUILDING CONSERVATION practice (UK)

The motivations behind conserving buildings are equatable to those behind general heritage protection as outlined in the previous sections (pp. 16-23). They build on the same central values and combine them with a desire for maintaining or restoring a building’s inherent character with an approach of honesty and integrity. This mentality characteristic of all modern conservation harks back in large parts to the first modern\(^7\) publication of a conservation manifesto by William Morris for the Society of the Protection of Ancient Buildings (SPAB) in 1877. In a climate where damaged monuments were regarded as an architect’s canvas upon which he could impress his vision of how the building should have been built, Morris and SPAB campaigned for protection in place of what at the time was termed restoration. The original manifesto from 1877 eloquently pleads:

‘to stave off decay by daily care, to prop a perilous wall or mend a leaky roof by such means as are obviously meant for support or covering, and show no pretence of other art, and otherwise to resist all tampering with either the fabric or ornament of the building as it stands’ (SPAB, 2009).

The approach to building conservation has in many ways changed since the founding of SPAB. The appreciation of the historic built environment has become wider in the sense that it now builds on broader public interest and support, as well as being more inclusive in acknowledging a large variety of building types beyond what are considered national monuments (Earl, 2003, pp.28-33). While Morris’s venerated proposals called for a complete stop of contemporary additions or changes to historic structures, modern conservation is much more engaged with management of change (see for example: EH, 2008; Jokilehto, 1998; Nasser, 2003; Rodwell, 2008). New uses and the inclusion of contemporary design are nowadays

\(^7\) ‘Modern’ in this context refers to modernity as the concept of a post-medieval, post-traditional society characterised by the rise of industrialisation and mechanisation as opposed to an architectural concept;
rightly appreciated and even encouraged, provided they are of high quality and executed in a manner sympathetic to the character of the building (Cramer & Breitling, 2007). The original SPAB concern that meddling with an ancient building in the way of imposing modern art could but destroy that building is widely overhauled, which English Heritage acknowledge through the term constructive conservation. Nevertheless, the introduction of distinctly contemporary design into historic fabric remains an emotionally loaded topic on both sides of the debate. In other ways, however, contemporary building conservation stays true to its historic roots and still promotes maintenance, minimal intervention and authentic materials and repair techniques for any building ‘which can be looked on as artistic, picturesque, historical, antique, or substantial: any work, in short, over which educated, artistic people would think it worth while to argue at all’ (SPAB, 2009).

Statutory building protection in the UK

Despite the fact that the conservation Charters (see below) have unified conservation efforts on a global scale in the second half of the 20th century, and are indeed continuing to do so, the individual nature of a nation’s cultural heritage requires a specific national approach to any form of architectural conservation. Therefore, due to the scope restrictions of this thesis, the following sections concentrate wherever possible and unless stated otherwise on the management of the historic built environment in the United Kingdom.

One of the first things one has to understand about building conservation practice is that every project is different and requires an individual solution. There is, as Howard aptly puts it, ‘no single yardstick’ (2003, p. 65). The combination of its specific age, rarity, style, history, physical condition, materials and techniques used, setting and associations renders each project unique. ‘The conservation of historic...”

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8 The controversy around the design of the (in)famous Sainsbury Wing of London’s National Gallery in the 1980s provides a prominent example: Robert Venturi and Denise Scott Brown’s temperate design solution won over Richard Rogers’ initial, outspokenly modern proposal, to which the Prince of Wales disparagingly referred to as a “monstrous carbuncle on the face of a much-loved and elegant friend” (The Prince of Wales, 1984)
structures is not a mechanical activity controlled by hard and fast formulae which, correctly applied, will produce demonstrably correct solutions’ (Earl, 2003, p. 3). For that reason statutory protection of historic structures, while legally binding, commonly remains a set of best practice guidelines rather than a rigid rulebook. Most contemporary conservation legislation concerned with the built environment has its roots in the one of the first internationally accepted conservation charters, the International Charter for the Conservation and Restoration of Monuments and Sites (The Venice Charter), in 1964, which, in 16 short articles, outlines a universal, interculturally applicable approach to the protection of the historic built environment (ICOMOS, 1964). Since then, a multitude of charters have taken up the principles set out in the Venice Charter (see Gillon, 1996). A direct comparison between the Venice Charter and the Burra Charter (1999, see p. 17) reveals how these general principles have evolved into a much more elaborate and specific structure, mirroring the benefits of decades of international conservation discourse and cooperation.

DESIGNATION

On a national level, conservation legislation can afford to be more country-specific, yet still has to remain flexible enough to be applied to all possible forms of built heritage deemed worthy of protection. Aspects such as age, rarity, aesthetic merits and regional as well as national and global interests (alternatively describable as heritage values) contribute to a structure’s overall (relative) significance, which in turn informs designation. In the UK, respective rhetoric referred to the process of identifying a protection status as listing, and to protected structures as listed structures up to the abandoned Heritage Protection Bill of 2008 and its follow-up document, the Planning Policy Statement 5: Planning for the Historic Environment in 2010 (PPS5)\(^9\). These documents signalled a policy shift from the in-or-out approach of listing towards a more flexible, inclusive system of assessment of (relative) significance, and changed prevalent terminology to

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\(^9\) These documents replaced the Planning Policy Guidance 15: Planning for the Historic Environment introduced as part of the Planning: Listed Buildings and Conservation Areas Act 1990
designation instead of listing and heritage asset as an umbrella term for all listed and designated structures and monuments. PPS5 was heavily criticised for unspecific wording and a lack of procedural guidance, which has in part been supplemented through the publication of a Practice Guide (Communities and Local Government, 2010).

In March 2012, PPS5 was in turn superseded by the National Planning Policy Framework (NPPF), which adopted the main principles laid out in the Heritage Protection Bill and PPS5 but does not express a clear presumption in favour of the conservation of designated heritage assets as outlined in PPS5. Instead, the NPPF operates on the presumption in favour of sustainability and sustainable development, of which the protection and enhancement of the historic environment is classed as a core principle while at the same time enabling development. This again serves to illustrate conservation’s constant balancing act between retention, enhancement and redevelopment. Although conservationists were reportedly outraged at the changes in legislation, fearing ‘devastating effects’ on the historic environment due to the simplification and unification of consent processes (Gray, 2011), any changes to the law bring about a customary clash of opinions. The proof, as the English proverb goes, will be in the pudding, as the real effects of the NPPF are yet to become apparent in the coming years.

Despite a shift in terminology and a (to date) widely untested new legislative approach, the three-tiered grading system designed to reflect a building’s relative significance used for listing is retained in all of these new documents:

- Grade I buildings are of exceptional interest;
- Grade II* buildings are particularly important buildings of more than special interest;
- Grade II buildings are of special interest, warranting every effort to preserve them (Department for Culture, Media and Sport, 2010b, p. 4).
While listing or designation itself is an identification stage rather than a fixed preservation order, as soon as a building is placed under statutory protection, most proposed changes to its structure or appearance require planning consent (EH, n.d.). English Heritage (officially The Historic Buildings and Monuments Commission for England) advises local authorities on the day-to-day regulation of heritage assets and acts as quality control to maintain a high standard of design, execution and workmanship. The final decision rests largely with the local authority’s conservation officials who base their ruling on current statutory guidance, which acts as a legally binding best practice catalogue for planning decisions affecting the historic built environment (Department for Communities and Local Government, 2010).

As of 2012, the United Kingdom has just over 374,000 listed buildings (of which most are residential buildings), some 20,000 scheduled ancient monuments and approximately 9,000 conservation areas (EH, n.d.), all of which fall within the definition of heritage asset. In some cases, a group of historic buildings may not be considered for individual listing but may yet derive special interest from its group value. Such neighbourhoods or groups of buildings are described in the Planning Listed Buildings and Conservation Act 1990 as conservation areas. These areas, while not under quite such rigorous control as listed structures, nevertheless enjoy a modicum of protection in order to preserve their often delicate special interest throughout development\(^\text{10}\) processes (Hammerson & Sangster, 2004).

While designated or listed structures constitute an invaluable benchmark for the appreciation of outstanding examples of the historic built environment, the bulk of structures within that environment are not covered by statutory protection. However, general principles of appreciation, maintenance and adaptation linked to designated heritage assets apply to all traditionally built structures to varying degrees. The Conservation game should thus take into prime consideration all historic buildings, and represent designated heritage assets as a small but highly significant sub-group.

\(^{10}\) ‘Development’ in this context refers to any work proposed or executed on a structure which requiring planning permission, listed building consent or conservation area consent.
Since the focus of this study lies on the promotion of building conservation awareness, the above merely presents a simplified view of the statutory protection afforded to the historic built environment in the UK.

**Building conservation practice issues in the planning system**

Practical building conservation relies on the successful interaction between local authorities, owners, developers and field specialists as well as the public, particularly with larger projects. The necessity of involving a conservation specialist and adhering to specific rules much stricter than under normal planning regulation puts pressure on all stakeholders. As illustrated by the redevelopment poster in Figure 1, conservation is often seen as standing ‘in the way’ of progressive development, while development in turn can be regarded by conservationists as aggressive money-making, which can naturally lead to mutual misconceptions and tensions in the development process. Mark Hines (2010) delivers a justified verdict by affectionately describing conservationists as passionate people fighting for their ideals. In many ways, conservation needs idealists to oppose radical progress for the benefit of future generations on the basis of what could be called cultural sustainability. English Heritage acknowledge that the effective adaptation of historic structures cannot always be market-led (EH, 2000, p. 10), as building conservation frequently opposes common (fiscal) sense with its demands for experienced surveyors, the specialist use of authentic, often largely disused materials, the employment of expert craftspeople and a lengthy application process. It is important for non-conservationists to understand and appreciate both sides of this dissent to make informed, sustainable decisions as built environment professionals, making the contextual understanding of building conservation within the property and construction sector a vital aspect of the Conservation Game.

The impact of a high density of protected buildings and areas on the planning system and property market is considerable – a report by Baker and Chitty from 2002 suggests that almost a third of all UK planning applications have a direct impact on the historic built environment (p. 24). It is further generally
acknowledged that approximately one in five buildings in use today was built before 1900. Whether these buildings are under statutory protection or not, they nevertheless ‘generate a great volume of maintenance, restoration and refurbishment work and it is inevitable that much of this work will continue to fall to practices with no established claim to building conservation expertise’ (Royal Institute of Chartered Surveyors, 2009, p. 3). In 2009, a survey of 147 estate agents found that properties within conservation areas are perceived as being of higher financial value compared to equivalent properties outside a conservation area due to buyer ‘confidence in the maintenance of area character in the future and the attractive environment’ (EH, 2009a).

Although conservation work and its management on both local and national levels is evidently in great demand, councils as well as statutory bodies have been faced with a steady reduction of financial resources for the best part of 15 years. Local authority spending on building conservation staff was reduced by 10% in real terms between 1996/97 and 1999/2000 (Baker & Chitty, 2002, p. 62). As early as 2000, English Heritage identified that 22% of all local planning authorities did not employ a qualified conservation officer (EH, 2000, p. 34). Although no newer data could be obtained on this particular matter, it can be reasonably argued that in a climate of economic struggle brought about by the banking crisis of 2008/09 and the ensuing recession, local authorities are unlikely to have increased public funding for conservation when essential frontline services are under direct threat. This becomes particularly apparent since the Government Spending Review of 2010 outlined a further 33% reduction to the Department for Communities and Local Government as well as 24% resource savings from the DCMS (with £9.3 billion ring-fenced for the London 2012 Olympics) (HM Treasury, 2010, pp. 48-65). This resulted in a 32% budget cut for English Heritage. Gibson and Pendlebury trace the dependency of public heritage funding on (shifting) government programmes back to the 1970s and the recognition that the support of heritage assets leads to cultural, economic, political and social benefits. The historic built environment is therefore argued to be constantly under threat of being instrumentalised for public
and social policy outcomes such as regeneration (2009, pp. 2-3; see also: Belfiore, 2002; Holden, 2004). The UK Government guidance for HM Treasury from 2003 indicates that ‘where possible, effort should be made to directly compare costs of projects and policies with their benefits’ (Eftec, 2005, p. 1), graphically illustrating a prevalent value-for-money approach towards building conservation funding.

In the light of widespread support but decreasing funds, the importance of a broader, non-specialist base of conservation appreciation becomes apparent. This fact is appreciated by English Heritage and RICS as well as the government, who aspire ‘that the value of the historic environment is recognised by all who have the power to shape it’ (DCMS, 2010, p.1). The true depth of government commitment to the hands-on protection of heritage assets as opposed to purely academic support currently (as of 2012) remains to be seen, since the Government Statement on the Historic Environment for England was published two months prior to the general elections of 2010, and seven months prior to the Spending Review. Be that as it may, it is in principle accepted that building conservation should be accessible to home owners, developers, planners and architects – in short, all those who indeed have the power to shape it. Yet in practice, building conservation processes are largely untransparent to laypeople due to a complicated and ill-communicated legislative approach (Baker & Chitty, 2002, pp. 33-35).

Trends and outlook – Building Conservation and New Media

Digital technology has found ready application in building conservation and heritage preservation first and foremost through its capacity for the facilitation of surveying and the accumulation, storage and distribution of data. More recently, its potential for two- and three-dimensional reconstruction and visualisation of any object from single artefacts to entire built structures and archaeological sites through CAD (Computer-Aided Design) software applications has become widely used (see section 2.2.3, p. 55). For example, 3D surveys of buildings can uncover and highlight structural deficiencies, which are a key concern in conservation. Visualisations (also discussed in section 2.2.3) are the focal point of current “New
Heritage” research (Kalay, Kvan & Affleck, 2008). In the course of conservation and/or archaeology, the special sensitivity of a site can require the restriction of physical (public) access or the removal of objects and artefacts from their original context. Digital reconstructions of such sites can allow virtual, global access to anyone with a computer, and ‘move the state of the art of preservation beyond static displays, capturing in cinematic or interactive form the social, cultural, and human aspects of the sites and the societies who inhabited them (Kalay, 2008, p. 2).

While the powers of digital technology offer exciting possibilities for the interpretation and presentation of heritage in a contemporary way, one should pause for a second to consider the impact of the medium on the information. In many ways, the availability of communication (mass) media determines the way information is both disseminated and stored (Bailey, 1998, p. 21). Script transformed the knowledge, which had been passed down orally from generation to generation, into a structured, linear, and retrievable format. Printed word superseded manuscript and placed a strong emphasis on text over image through the limited affordances of the printing press (Bailey, 1998, p. 21; Kalay, 2008; see also p. 21). The use of computers is gradually reintroducing the image as a key source of information, a feature which is discussed in more detail in section 2.2.3 (p. 55). Yet, as ever with any form of presenting heritage, the default incompleteness of our knowledge about the past (see Lowenthal, 1985) means that any representation, any reconstruction, must always remain an interpretation and is thus imprecise (Champion, 2008, pp. 215-16). In the spirit of this Benjaminian consideration (p. 16), Malpas warns against taking for granted the ‘abandonment of the material in favour on the non-material’ (2008, p. 15) through the lure of technological innovation.

The cultural benefits of digital representations of sites and structures are undeniable but any reconstructions and the choice of one interpretation over another must be carefully considered in order to avoid misrepresentation and conflict, similar to the balancing of different cultural values described previously (p.
On the other hand, the ease of data storage allows for multiple interpretations of one site to digitally coexist side by side, offering huge potential for academic insight through the comparison of variable views and perspectives. Silberman sees the task of digital heritage in the facilitation of social interaction within the context of a site rather than the establishment of a ‘definitive simulacrum of the past’ (2008, p. 81), which in any case is unachievable due to the nature of heritage as a cultural construct (as discussed on p. 16). Despite the possibility of visitor (or learner) engagement with multiple dimensions of a digital reconstruction, Kraidy laments the fact that computer visualisation is a highly mediated form of accessing information (2002, p. 95). While it is certainly true that a computer cannot show information which has not been provided by a programmer or author, this issue is not exclusive to digital technology. Books as much as any other method of storing and disseminating information are also dependent on the initial selection, interpretation and presentation of said information by an author, which renders information in books as mediated as data on computers.

2.1.3 BUILDING CONSERVATION EDUCATION

Due to its prominent position in everyday life, coupled with an ever-pressing need for resources to remain operable, building conservation requires public support as much as statutory protection. Not only are many conservation projects indirectly funded by the taxpayer through government budgets, but most heritage organisations depend wholly on the engagement of volunteers in their day-to-day operations. Due to its direct links with understanding and consequently, designation, education is a key aspect of heritage in general. In order to preserve and increase public interest in heritage and support for its protection, English Heritage (among others) is constantly campaigning to anchor the historic (built) environment more firmly in national school curricula. Engaging young children in the historic environment is believed to ‘establish long-term foundation and lifelong interest’ (EH, 2000, p. 23) and build a sense of place and identity. Schools provide an ideal backdrop through their natural organisation of groups of students into captive audiences. This type of conservation education, which is much rather like heritage
awareness training, aims to create appreciation of the historic environment on a very wide grassroots level. Jukka Jokilehto stressed the ‘importance of sensitizing communities at the grassroot level’ (1998, p. 19). While the strategy of growing heritage appreciation in very young learners is valid in its own right, it leaves a distinct gap at secondary and tertiary education levels, underlining the validity of developing a Conservation Game for university students.

On the other end of the scale, conservation organisations, education institutions and various trusts provide a growing variety of specialist conservation education, academic as well as vocational, and specialist crafts training in various course formats, such as Continued Professional Development (CPD) courses through to university degrees (Courses, n.d.). A more in-depth presentation of the available training options can be found in Chapter 4.2.2 (p. 103).

While heritage and conservation education currently caters for both ends on a sliding scale of conservation proficiency which ranges from basic awareness through to specialism, very little seems to be provided for those working the middle of that scale. As outlined in the previous sections, the historic built environment makes up a very significant part of the overall building stock on the one hand and of Britain’s cultural heritage and identity on the other. Many, if not all practicing built environment professionals will at some point in their career encounter projects of a conservation-sensitive nature, but are being provided with very little opportunity to learn about conservation. A report by the National Heritage Training Group in 2008 into skills and training in the built heritage sector found that two thirds of all built environment professionals working with the historic environment felt inadequately prepared for working on pre-1919 structures by their formal education (2008, p. 13). If for the general public heritage awareness starts in schools, then for those aspiring to work in the built environment, practical conservation awareness should start in higher education. This thesis looks at the reasons for this apparent lack of conservation training opportunities on a non-specialist level (see Chapters 3 to 5)
and proposes a conservation awareness and skills training application for use in UK Higher education (Chapter 6).

2.2 Built Environment Education and New Media Learning

In this section, the project investigates general practices in built environment education in a HE format across and beyond the United Kingdom and the relevant key learning theories. It will then briefly address the issues of adult learning and learning through new, digital media and give examples for the established use of digital media applications in tertiary built environment education. While the previous section 2.1 aimed at setting the scene in terms of outlining the ideological background and contemporary challenges for building conservation, the following section reviews relevant learning and teaching strategies as a theoretical basis for the Conservation Game.

2.2.1 Learning Theories in Built Environment Education

The intellectual domain of educational and learning theory and philosophy is vast and changeable; a field in which much is proclaimed and energetically championed, yet little can be factually proven. Even the terms education and learning are being interpreted in many different ways, ranging from the most formal form of instruction to the most intuitive, self-driven accommodation of knowledge and understanding (see for example Kirschner et al, 2006; Twigg, 1994). It is not within the scope of this thesis to discuss more than the most prevalent theories directly relevant to built environment education in a higher education setting, which in the following will be introduced to the reader. In the context of this thesis, education (unless specified differently) refers to formal, often institutionalised instruction and the resulting learning processes, while learning is regarded as the process of creating knowledge mainly through the transformation of experience (see also: Kolb, 1984, p.38).
Experiential Learning and related concepts

The above mentioned experience is a central concept in one of the most prevalent learning theories in built environment education, and indeed much of contemporary higher education in general. Experiential learning, learning through experience, is a theory coined by David A. Kolb in the early 1980s. Building on the early 20th century work of John Dewey11 as well as the writings of Kurt Lewin12 and Jean Piaget13, experiential learning describes the underlying structure of the learning process as a combination of two equipotent aspects of successful knowledge construction: ‘prehension, [...] processes of grasping or taking hold of experience in the world [and] transformation, [...] ways of transforming that grasp or “figurative representation” of experience’ (Kolb, 1984, 41).

Figure 4: Structural dimensions underlying the process of experiential learning (adapted from Kolb, 1984, p. 42)

As illustrated by the structural model in Figure 4, the prehension dimension consists of two dialectically opposite ways of grasping experience, one through concrete experience (apprehension) and the other through symbolic representations of experience (comprehension). The transformation dimension features two similarly opposite ways of transforming information, one through intentional reflection and one through extensional action. Together, these four forms of knowledge build the experiential learning cycle of concrete experience, reflective observation, abstract conceptualisation and active experimentation originally formulated by Lewin. Both perception and transformation aspects are equally important in this model: Perception of experience without being acted upon is insufficient for learning; similarly, transformation must be preceded by experience in order for transformation to become possible (Kolb, 1984, pp. 40-59). An interactive (digital) learning environment such as proposed by the Conservation Game can effectively draw on each aspect of this learning cycle through the provision of an engaging, contextual and relevant (learning) experience.

The theory of experiential learning is closely related to the constructivist learning theory, which also builds on the foundations of Dewey’s, Piaget’s and Lev Vygotsky’s\textsuperscript{14} work. Within this framework, learning occurs as the construction of one’s knowledge from one’s own experiences, a ‘self-activating response to challenges, dissonance, or discrepancy’ (Mathewson, 1999, p. 36). Constructivist learning thus describes a model similar to that of experiential learning, yet with more of an emphasis on the prehension aspects of knowledge acquisition. On the other hand, the transformative dimension is related to the separate model of transformative learning formulated by Jack Mezirow. This model describes a change of perspective on a ‘meaning scheme’ (beliefs, attitudes, emotional reactions; also called frames of reference) through critical reflection on experiences and assumptions (Mezirow, 1991, p. 167; 1997, passim). This critical reflection often occurs through dialogue and discourse and is seen as a catalyst for autonomous and

\textsuperscript{14} Vygotsky, L. S. (1926). \textit{Educational Psychology}. 
responsible thinking in adults (the specifics of adult learning will be addressed in this chapter in a short while).

Experiential, constructivist and transformative learning aspects are often fused in so-called **problem-based learning** scenarios, which confront the learner with a new, problematic situation which requires factual analysis, creative thinking, adaptation and frequently team work to be resolved, resulting in a broadening of horizons for students and a sense of personal accomplishment upon completion (Peck & Dorricott, 1994). Problem-based scenarios usually occur as part of interactive learning environments such as project work, case studies, role play and simulations, which will be discussed in more detail in section 2.3 (p. 64).

Despite the theory’s considerable influence on past and current academic work, the above mentioned focus onprehension illustrates the main center of criticism of constructivism. Building on self-guided discovery, constructivism is much freer in its approach than experiential learning. This aspect has been criticised as ineffective particularly in connection with novice learners (Kirschner et al., 2006; Mayer, 2004) on the basis that minimally guided instruction overstretches working memory in favour of long-term memory (the alteration of which Kirshner et al. term learning), leading to incomplete understanding. A modicum of guidance on processes, methods and contents and their interaction (also called epistemology as discussed in detail in section 2.3.1 from p. 70) should thus be considered imperative for any experiential approaches to teaching.

All of the above terms are commonly used in higher education discourse and have been identified by the author as particularly relevant to built environment education. Despite the above criticism on experiential and constructivist approaches, the author believes in the validity of well-structured experiences in the learning process, particularly in connection with complex multidisciplinary work environments such as the built environment. While the original concept of experiential learning was proposed as a holistic integrative perspective on all
learning, the term is used slightly out of context within the built environment due to its semiotic relationship with experience in the sense of practical and/or work experience. Its meaning in the context of built environment education is often adapted to designate sandwich years, (short-term) work placements, case study and project work as well as sponsored travel (Harris, 2004, p. 3). This directly leads over to another characteristic feature of learning within the built environment: that of praxis.

Praxis

By and large, the built environment sector consists of professions and practices which transitioned from being what is contemporarily known as vocational subjects to university degree level in the 1980s and 90s. In the UK, this is specifically traceable to the Further and Higher Education Act 1992, which abolished the previous differentiation of the higher education sector into a binary system of universities and vocational post-secondary education such as polytechnics. As such, management became increasingly removed from the craft end of the sector, and practice-driven education made way to theory-driven approaches in the sense that learning “to do” morphed into learning “to know”. This prevalent educational format has been under increasing criticism by educators and practitioners alike, who aim to re-introduce the practice element into built environment education. Van Manen quotes David Schön saying that ‘professional education undervalues practical knowledge and grants privileged status to intellectual scientific and rational knowledge forms that may only be marginally relevant to practical acting’ (1995, p. 33).

In a wider sense, this is hardly a new development. At the turn of the last century, schools had been firmly established as the dominant educational institutions and while numeracy and literacy skills were being developed, society saw a decline in so-called domestic arts, skills which would allow a young person to be employed in manufacture (Waks, 1997, p. 394). To address this, schools began to deviate from conventional instruction through recitations and demonstrations and
gradually introduced learning projects\textsuperscript{15} which simulated practical (manual) tasks at work or the home (Dewey, 1900, p. 13). While John Dewey, who is nowadays considered one of the founding fathers of praxis-orientated education, believed in the benefits created by this type of instruction such as increased student engagement and better preparedness for adult life, he also lamented the approach to be unnecessarily narrow, searching instead for the wider social significance of practice in schools (1900, pp. 14-18). Understanding, like Bode (1927, p. 150), that albeit beneficial, such projects could neither fully replace traditional instruction nor prepare a student sufficiently for industrial work, Dewey argued for an education in what he called industrial intelligence: an understanding of one’s place in the mechanics of an industrial society. He objected strongly to the more pragmatist approach of David Snedden, one of his contemporaries whose interests lay in developing vocational education as what can essentially be described as school-bound apprenticeships (Drost, 1977, p. 21) and condemned ‘the identification of education with acquisition of specialized skill [...] at the expense of an industrial intelligence based on science and a knowledge of social problems and conditions’ (Dewey, in Labaree, 2010, p. 167). In other words, Dewey sought the integration of praxis-orientated contents into education in an ideal system which would favour neither the purely academic nor the purely vocational to equip students with initiative and applied intelligence to be able to make informed decisions\textsuperscript{16} (Rogers, Kahne & Middaugh, 2007, p. 20).

Although Dewey has influenced the intellectual debate on the connections between education and the workplace within the wider society for a century, the situation in educational practice has not necessarily changed. Kliebard argues that this may be partially due to the idealistic nature of Dewey’s proposals over the more readily deployable, utilitarian system advocated by Snedden (1987, p. 139). As Labaree puts it, Dewey’s ‘pedagogical progressivism is still standing outside the gates to the schoolyard, trying to break in’ (2010, p. 186). Although implementation

\textsuperscript{15} A typical project would be a girl designing and making a dress (Waks, 1997, p.396)

\textsuperscript{16} The debate around Dewey’s vision originated in the United States and was originally centred around the US school system but can in principle be applied to the western world as a whole
difficulties have so far stood in the way of Dewey’s vision, new interactive learning environments made possible by digital technology (as described in sections 2.3, p. 61 and 6.3, p. 202) can help overcome this barrier and introduce richer, more inclusive learning experiences.

Returning from this excursion into general schooling to the realm of higher education, the picture which presents itself is much the same. The Rogers report from 1999 argued that Higher Education Institutions (HEIs) in the UK ‘may give too academic an emphasis, divorced from the real world’ (1999, p. 165). A further point of criticism was and is the tendency in HE to focus on encapsulated professional specialism largely unconnected to other sector professions, leading to considerable skill shortages in graduates (Bailey, 2005, pp. 49-56; NHTG, 2008). With these skills shortages becoming particularly apparent in the (non-) availability of young professionals for challenging leadership positions, especially in multi-stakeholder environments such as urban planning and urban regeneration (a considerable part of which is building conservation related – see for example the Amion Consulting report for EH, 2010), and considering that this skills shortage was identified over ten years ago, one would expect HE to have adapted its programmes accordingly. The rhetoric demanding more inclusive built environment education and increased interdisciplinary practice however by and large remains the same (see among others: Chapman, 2009; Klostermann, 2011, pp.325/26). Be that as it may, the problem is certainly being gradually acknowledged in both industry and education sectors, and undergraduate built environment programmes are becoming more inclusive, with internships during degree study being one of the most prominent examples (see also the results of the course inventory, Chapter 4.2.3, p. 107). Nevertheless, the majority of content in built environment education is still presented in a format which students (affectionately?) call ‘death by PowerPoint’, leaving ample room for improvement.
REFLECTIVE PRACTICE

Internships, or professional practica, are training scenarios where a learner who is relatively new to a work environment is being trained to be a member of a professional community through a mixture of learning-by-doing, mentor support, reflection and communication with peers and superiors. Practica are valuable because they convey not only practical knowledge, but also develop a reflective practice where by way of a problem or puzzling event one’s own professional assumptions can be questioned and evaluated, which should in turn lead to the reframing of said assumptions and the pursuit of a novel course of action (Loughran, 2002; Russell, 2005). Schön formulated this skill in a professional’s repertoire as reflection-in-action: upon encountering a problem, the professional ‘reflects on the understandings with have been implicit in his action [up to this point], understandings which he surfaces, criticizes, restructures, and embodies in future action’ (1983, p. 50). In other words, reflection-in-action describes the ability to un- or semi-consciously reflect on a new problem, challenge personal assumptions in the light of this new situation and devise an appropriate, new solution. This allows professionals to make informed and creative decisions in an immediate fashion as opposed to reflection on action, which is a retrospective cognitive process temporally removed from the action. For architecture (as well as other design disciplines), the development of reflective practice is an integral part of professional education due to design’s inherent emphasis on problem-solving, yet entirely lacks in most other built environment disciplines.

The method of training through internship, often called situated learning, is common practice in many professional branches, notably also those centred on the design and management of the built environment. It is part of Lave & Wenger’s 1991 concept of communities of practice, which describes communities who ‘engage in a process of collective learning in a shared domain of human endeavour’ (Wenger, 2006, p.1). It other words, it describes practitioners who are connected through a domain of shared professional interest, in which skills are developed and information discussed and shared. Each community of practice thus engages in their
separate reflective practice. David W. Shaffer, whose promising research into learning games employable in built environment education will be discussed in Chapter 2.3 (p. 61), builds on these concepts and their inherent training methods to develop his learning models.

The concept of praxis as it is understood today, a process of enacting skills, lessons, theories or ideas, goes back to Aristotle’s characterisation of the three basic activities of men: *theoria*, the knowledge aimed at discovering truth, *pioesis* (or poesis), the knowledge aimed at production, and *praxis*, the knowledge of action (Carr, 2006). Aristotle’s original concept of praxis refers to (the practice of) activities which are valued in their own right and which are not necessarily tied to outcome or productivity. Based on this, Balaban (1990) argues that contemporary society views praxis increasingly as a means to an end, thus confusing *praxis* with *poesis*. To Balaban, this confusion, which seems to be of minor relevance to anyone but a student or practitioner of philosophy, unsurprisingly arises from Western society’s love affair with efficiency and productivity. Praxis automatically suggests *doing*, and today’s view is certainly dominated by an emphasis on doing *because*. When put into the context of learning, and particularly the acquisition of such skills as promoted by Empistemic Games, praxis indeed suggests strong links to “the industry”, which by definition is product-oriented.

**Competency**

Along the lines of productivity-orientation, Bailey points out that over the past decade ‘the whole built environment labour market has experienced a policy environment where increasing emphasis is placed on achieving targets and delivering outputs’ based on short-term funding (2005, p. 52). In this climate, HEIs have increasingly turned towards developing competencies in their students. Competency (as defined by the US Department of Education) is a ‘combination of

17 While this statement provides another example of the prevalent academic preoccupation with “us” and “the other” (the West v the rest), it seems prudent to note that although perhaps most imbued with the concept, western society is by no means the only contemporary society focused on productivity and efficiency.
skills, abilities, and knowledge needed to perform a specific task’ (Jones, Voorhees & Paulson, 2001, p. vii). While the definition, which in essence is globally shared across institutions and organisations, points towards the necessity for theoretical knowledge paired with practical experience, the emphasis lies clearly on the ability to perform a task to required standards. The productivity/efficiency tendency identified in the previous paragraph is mirrored here, and even though competency as a term is most frequently used in US and Australian publications, its ideological backbone influences UK higher education just as much. It is worth noting that while competence (or competences) is often used synonymously with competency (or competencies), there exists a slight semantic distinction in that competence denotes broad capacities and general capability, while competency refers more pointedly to actions (and thus, performance) (Hyland, 1996).

In a capitalist society, the benefits of performance-based training are obvious, yet competency-driven HE has come under criticism due to its ‘seeking to divide professional practice into discrete, specialised and contained tasks, where no resources are to be wasted on learning anything other than those particular discrete, specialised and contained tasks’, leading to training becoming ‘reductionist and prescriptive’ (Newton, 2009, p. 103; see also: Betts & Smith, 1998). This tendency can be also identified in the UK HE system, as outlined (among others) by Chapman (2009) and illustrated in Chapters 4.2 (p. 103) and 4.5 (p. 149). This is not to say that all competency-based training is narrow-minded and purely target-oriented, but the development of competencies has been noted to be better suited for post-education training rather than HE, which should be more holistic in nature to address the requirements of professional practice (Newton, 2009, p. 103; see also: Chapman, 2009; Klostermann, 2011). In this context it is of value to address a terminological differentiation between training and education, which are frequently used interchangeably. The difference can be roughly boiled down to training leading to know how, and education leading to know why (see for example: Abudi, 2010), or, as Jones puts it, training is concerned with the process, and education with the product (1995, p. 44). In this sense, education is by definition more inclusive of
other practices than training, and should arguably be given precedence over training in postsecondary formal learning environments.

The author agrees with calls for specialised training to be conducted in a work environment and for built environment education to take a more holistic route while at the same time increasing student exposure to subject-relevant professional practice early on as part of their education. Figure 5 illustrates the hierarchy of postsecondary (or in UK terminology, tertiary) education outcomes as laid out in the Jones, Voorhees & Paulson report (2001, p. 8).

![Figure 5: A hierarchy of postsecondary outcomes (from Jones, Voorhees & Paulson, 2001, p. 8)](image-url)

This pyramid model describes the compaction of knowledge and skills from a broad awareness level, here called ‘Traits and Characteristics’ up to the assessment of performance through demonstration of competencies. In other words, the model illustrates in very simplistic terms the learner’s journey from initial understanding to subject mastery. Such targeted training seems feasible only if applied to a single subject, which in built environment education can lead to the above mentioned reductionist approaches.
In a holistic HE learning environment, where students are introduced to broader range of subjects and practice-relevant issues and discussions, reaching the top of this pyramid in every subject is simply not a realistic aspiration\textsuperscript{18} due to restraints on teaching time. Therefore, Figure 6 proposes an adapted version of the Jones model where the four layers of expertise are split into two groups, in which higher education provides a firm grounding to a subject and practice-relevant, output-oriented competency is developed later through professional practice. A fifth layer is introduced, indicating that the line drawn between comprehensive subject understanding and the development of competencies is indeed not a line at all but a fluctuant border where the decision of when to stop educating and when to start training must be taken in accordance to the needs of the respective professional practices.

![Figure 6: Adapted competency pyramid model to indicate the role of HE in the process of competency acquisition](image)

Taken one step further, the pyramid model can be seen as the representation of a specific subject within a built environment profession. A holistic practice would center around a wide range of subjects, of which some are more prevalent than

\textsuperscript{18} This statement should be seen in relation to undergraduate degrees and does not take into account the possibility that highly specialised postgraduate routes must on occasion and by necessity provide just such a specialised training. This, however, is not the topic of this discourse.
others. If arranged at each other’s sides, these respective pyramids form a circular model of ideal built environment education and training as outlined in Figure 7. The layers of expertise of the proposed pyramid model are retained with the outer circles addressed by HE and the inner circles dealt with as part of post-HE training.

![Figure 7: Holistic approach to built environment education and situated thesis project interest](image)

Figure 7 also illustrates the operational field for this thesis within an assumed holistic undergraduate built environment degree, where one of the peripheral subject pyramids is a conservation- or regeneration-relevant subject. As shown in the graphic, this thesis concerns itself with the outer two layers of historic built environment expertise and their overlap with adjacent subjects within a generic built environment degree.

**Adult Education**

All of the previously discussed learning and education theories are, within the scope of this project, concerned with their application in learning environments for adults. Claims that adults are to be taught differently to children go back as far as
and have persisted up to the present day. This section briefly explores the relevance of these discussions for this thesis.

Since the 1970s and 1980s, when workplace dynamics in the western world increasingly demanded individuals to be more flexible in their careers and changes of professions and career paths became increasingly common, the study of adult education has drawn a growing followership (Howe, 1977, p. xii). The term *andragogy*, originally coined by Alexander Kapp in 1833, has become much discussed as ‘the discipline which studies the adult education process or the science of adult education’ (Nottingham Andragogy Group, 1983, p. v). Malcolm Knowles is regarded as one of the most prominent advocates of andragogy through his publication of the four central characteristics of adult learners in 1984. He describes how adults are more self-directed than children; they have a greater reservoir of experiences to draw on as a learning resource; they possess an increased readiness to learn in accordance with their social roles, and their type of learning has largely matured from subject-centeredness to problem-centeredness (Smith, 1996, par. 2).

While these characteristics are undoubtedly insightful, their publication has rightfully drawn sharp criticism from the start due to the fact that these are characteristics rather than a fully formed theory of either learning or teaching (Hartree, 1984, in Merriam & Caffarella, 1991). It is further not sufficiently verifiable that adult learning is indeed fundamentally different to child learning and that the use of a specific term is justified (Smith, 1996, passim). The word pedagogy thus continues to be used in conjunction with higher education. However, one recurring parallel to other publications concerned with adult or tertiary education is the reference to transformative learning, which as previously described on page 36 is related to experiential learning and concerned with the transformation of perspectives through reflection and discussion of experiences. This allows adults to

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19 See Alexander Kapp’s work: *Platon’s Erziehungslehre, als Pädagogik für die Einzelnen und als Staatspädagogik* (Plato’s theory of instruction, as individual pedagogy and as pedagogy for the state)

20 From the Greek *andr-*, meaning ‘man’, and *agogos*, meaning ‘leading’ (as opposed to pedagogy from *paid-*, meaning ‘child’); see Smith (1996), par.1
be ‘more aware and critical in assessing assumptions […], more aware of and better able to recognize frames of reference and paradigms […] and to imagine alternatives, and more responsible and effective at working with others’ (Mezirow, 1997, p. 9). These capabilities are precisely those demanded by the modern workplace environment, and the capacity of tertiary built environment education to incorporate transformative learning through digital media will be discussed in sections 2.2.3 (p. 55) and 2.3 (p. 61).

### 2.2.2 NEW LEARNING FOR NEW LEARNERS?

In 1975, Michel Foucault published his work *Surveillir et Punir (Discipline and Punish)*, in which he describes the power of discipline through time-tabled routines originally established by the monastic tradition. This system of rhythm, imposed occupation and regulated repetition soon found its way into the schools, which at the time were almost exclusively extensions of monastic influence (1995, p. 149). An illustration by Laurentius de Volletini from the second half of the 14th Century (Figure 8) shows a medieval classroom immediately recognisable as such in its similarity to contemporary classrooms and lecture theatres. Even the fact that one student is apparently asleep and at least one appears seriously bored while others seem to have conversations with each other resonates with our image of formal education.

![Figure 8: Laurentius de Volletini: Hernicus de Allemania in front of his pupils (from the Liber ethicorum des Henricus de Allemania, 2nd half of the 14th century; currently at the Kupferstichkabinett, Berlin)](image)

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This rather historic image of education has permeated contemporary society (and is continuing to do so) to such an extent that even fantastic visions of the future paint education in a similar light, as illustrated by a scene from the science fiction series Star Trek: Deep Space Nine (Figure 9). The use of technology in this image does not alter the fundamental layout of the classroom, nor does the presence of a teacher suggest anything other than supervised learning in a futuristic setting but historic format. Speaking about contemporary education practices, Woolsey actually refers to the ‘medieval models of university education’ (2008, p. 215) which have largely prevailed despite the majority of information now being transmitted digitally.

The meteoric rise of the digital entertainment industry with the advent of home computer systems in the 1980s (Hostetter, 2006, par.4) has given birth to the now widespread belief that digital games, similar to more traditional, analogue but playful ways of instruction and learning, have a place in education. Authors such as Prensky (2006) claim that the youth of today has become ‘disengaged with traditional instruction’ (Van Eck, 2006, p.17) as they are fine-tuned to the ways of acquiring information and forming knowledge in a digitally dominated world where multiple streams of information can be accessed simultaneously and performance
feedback is immediate. For them, technology is a friend and tool rather than the opponent it sometimes is to older generations. These so-called children of the “Net Generation” or “digital natives” are claimed to be the product of early exposure to digital media and particularly, digital games, developing important problem-solving, multi-tasking, hypothesis-testing and visual/spatial skills (see also section 2.3) as required by the games they’re trying to beat (Hostetter, 2002, par. 6-11). As academic literature is still predominately produced by people who were only introduced to digital technology in a later stage of their lives, these “digital natives” are often (and somewhat ludicrously) referred to in a nigh-on revered manner, as if the very fact that they were born into technology-dominated surroundings had somehow made them superhuman. A widespread academic opinion in game-based learning research is that learning itself has changed, and that instruction has to change in accordance, that these “new” learners demand to be catered for differently, and digitally (Prensky, 2006).

If one follows the concept of “digital natives” to its logical origin, one must concede that this idea has to be confined to first-world children with early exposure and ample access to technology. Consequently, children of less privileged backgrounds, who have no knowledge of computers or modern technology and who therefore are not “digital natives”, must be not only less able to use computers but also less suited to this allegedly “new”, multi-media based, multi-stream, discovery-led way of learning. However, a series of studies conducted by Sugata Mitra and Vivec Rana, which placed openly accessible computers in slums in India where most people had never seen a computer before, suggests that computer literacy can be acquired within a relatively short time without the requirement of prior knowledge or outside instruction (Mitra & Rana, 2001). The children, more so than the adults, very quickly learned to navigate both the computer layout as well as the internet, although most had little more than a very limited understanding of English. They taught themselves and each other to use MS Paint, create documents and folders and copy and paste elements. The learning process observed by Mitra and Rana and described in their paper suggests a strong similarity to learning
processes exhibited within the first stages of playing a new computer game: those of trial and error, observation and hypothesis testing – indeed the same skills Hostetter summarises to be central to the learning processes of “digital natives” (2006, par.7). Recent research into technology use by UK students further suggests that the at times assumed compulsive use of digital communication technology, while widespread, is far from omnipresent, thus somewhat dispelling the myth of a ‘net generation’ (Morgan, 2012).

While it is certainly true that more exposure to and practice with computing technology fosters greater expertise in children from developed countries, there is little evidence to support that their learning styles are in any way different to those of less privileged children, given the same opportunities. A child’s inherent curiosity will cause it to interact eagerly with a new toy, and it is only the availability and nature of the toy that differentiates the children from an Indian slum and those of a London suburb. Pivec and Pivec (2008; 2010) argue that computers have not changed the way new generations learn, but rather that they have become a welcome discovery tool for creative learners. Clark (1994) and Joy & Garcia (2000) report similar findings from reviewing comparative studies on the learning effects caused by the delivery of content through different media. Although Joy & Garcia conclude that many of these studies suffered from inherent design flaws and should thus be viewed with scepticism, they agree with Clark that learning effectiveness is influenced by well-conceived instructional design strategies rather than the media through which content is delivered (2000, p. 38; see also: Mathewson, 1999, p. 48; Holland, Jenkins & Squire, 2003, p. 37). Technology, while potentially vastly superior to traditional conveyors of content, is argued to be just that: a conveyor, which, if chosen appropriately, can enrich instruction but will not change learning as such.

The author sees the root of the “new learning” disagreement in varying interpretations of the term learning. If one regards learning as the assimilation of knowledge or skill, then Mitra and Rana’s findings make a good case for arguing that learning is still as it has always been. Some definitions however also take into
consideration the experiences during learning and influences from the wider learning environment, in which case one may say that computer use has indeed had an impact on how people learn. In the author’s opinion, and for the purpose of this research, learning goes by the former definition of acquisition and transformation of knowledge and skills, which in itself is considered to be largely unchanged by computer use. However, the author also acknowledges the changes in people’s learning environments brought about by the introduction of personal digital technology. Indeed, this acknowledgement is and was a central motivation for this research in the first place.

In what sense, then, is the concept of “digital natives” and their alleged resilience to traditional instruction relevant to this thesis, which after all focuses on adult learners? For one, this project looks at conservation instruction in the (near) future, by which time almost all new students entering university in the developed world will have grown up around a constant supply of digital media. Should learning indeed have changed, this would have a large impact on the thesis. Further, the concept of computers and digital media creating opportunities for creative learners is very interesting for the field of building conservation, as creative learning and thinking is precisely what is expected from professionals in a field where no project is ever the same and new solutions have to be found on a regular basis. However, Frank (2011, p. 2), referring to the prevalent use of digital communication technology and a general tendency towards uncritical digitalisation, concedes that ‘learning styles are not fundamentally changed by being able to search the library catalogue online instead of flipping through paper cards and browsing book shelves’. This statement highlights the necessity for developing and using instruction methods which do not simply apply historic models in a colourful way on screens, but use the engaging power of computers creatively to allow students to discover learning experiences beyond what is possible in a traditional classroom (Woolsey, 2008, p. 212; see also: Tapscott & Williams, 2010). It is not so much new learning but rather new teaching which is really up for debate here.
Interactive Practice: Towards a 21st Century Education

“The scandal of education is that every time you teach something, you deprive a child of the pleasure and benefit of discovery.”

Papert, (1996) p. 68

While learning in itself may not have changed, but may simply have adopted computers as a powerful learning tool, there is definitely a case for a general change in instruction. True to Papert’s quote, the intellectual environment surrounding formal education has begun to acknowledge that the time-honoured tradition of “reading” a subject (i.e. taking a university course), the term itself suggesting a fairly passive approach on behalf of the learner, may be inferior to a more learner-centred, non-linear educational approach. These new approaches, most of which heavily feature learning in context, group work, practical, hands-on experiences and active interaction with both learning environment and contents, benefit from the multi-modal nature of digital information systems (Kiili, 2005; Peters, 2000)). Non-linear, multidimensional learning is believed to be well suited for delivering complex contents by fostering a ‘deeper understanding of complexity and nuance, understanding that provides learners with a basis for going beyond what was explicitly taught’ (Spiro & Jehng, 1990, p. 203). Non-linear in this context refers to open-ended information systems such as the internet, where information gathering operates on a pick-and-choose basis (as opposed to books, which are commonly used in a linear, from-A-to-B fashion). The author agrees that used correctly, digital technology offers the possibility to move beyond the medieval model of instruction towards a more learner-centred educational experience (see section 2.3.1, p. 70).

David W. Shaffer argues that in a world connected by computers, where standardised jobs can be outsourced to countries all across the globe at the speed of a mouse click, the competitive economic edge of developed countries can only be retained by offering specialist products and services. Instead of teaching standardised contents aimed at passing standardised tests, postindustrial education
should be preparing learners for complex, creative and connected thinking which will enable them to solve non-standard problems (Shaffer, 2004b, p. 1403; 2009, pp. 1-5). Although no direct reference is being made, this position is, in all likelihood, derived from Robert Reich’s 1991 work on present and future workforce characteristics. Reich defines people with the above skill sets as ‘symbolic analysts’ (1991, p. 182), whose responsibilities within the work environment lie in the identification and solving of problems and information brokering. Shaffer’s argument is substantiated by Reich’s claim that the percentage of these ‘knowledge workers’ has increased from 8% to 20% between the 1950s and 90s (1991, p. 177).

While these figures are approximations for the US labour market, it can be reasonably assumed that similar shifts from production to service to information economies are occurring throughout what is here termed postindustrial societies. The use of this terminology in the context of the globalisation of labour markets is, albeit widespread (see for example: Garrison, 1997; Tapscott & Williams, 2010; Waks, 1997), somewhat contestable. It may be true that western societies have largely moved beyond a production-orientated economic model. However, emergent economic powers in developing countries such as China or India currently play a dual role as both destinations of western production outsourcing as well as growing information services competitors on a global scale. In this light, especially in a global context and taking into consideration that industrialisation and the economic move beyond are ongoing processes, the use of the term postindustrial education is rendered problematic. For this reason, the term 21st century education is adopted for this thesis in conjunction with non-typical (in the sense of non-traditional), potentially digital educational theories and methods.

While Shaffer argues that computers and with them the associated ease of global task distribution necessitate a change in education to maintain a competitive workforce, they are at the same time the tool which makes this possible on a large scale (2004a; 2009). Digital applications have the power to create immersive, interactive (learning) environments in which exploration and experimentation can
provide the richness of learning advocated by Dewey in complete safety and irrespective of geographical location. The author agrees with Van Eck, who argues that the key to successful applications of digital media for learning lies in the distinction between the use and integration of media. ‘Using media requires only that the media be present during instruction. Integrating media, on the other hand, requires a careful analysis of the strengths and weaknesses of the media, as well as alignment with instructional strategies, methods and learning outcomes.’ (2006, p. 30).

2.2.3 NEW MEDIA USE IN BUILT ENVIRONMENT EDUCATION

The built environment sector, much as any other aspect of economy and society, readily embraced the development of digital technology as a powerful facilitator of processes. While the computer’s immense new capacity for data storage, processing and sharing has become a commonplace tool for all economic contributors, the built environment industry has particularly benefited from the computers’ aptitude for visualisation. Visualisation brings disjoint information together in a bid to help interpret that information (Stokes, 2001). The ease of image creation and distribution on screens, particularly with the capacity for creating three-dimensional and even four-dimensional (animated, moving) representations has led to a multitude of professional CAD (Computer-Aided Design) applications (Arayici & Hamilton, 2005; Heesom & Mahdjoubi, 2004; Pullar & Tidey, 2001) in use throughout the sector. Digital technology for example facilitates the visualisation of data from largely sequential sources and databases for Geographic Information Systems (GIS) purposes (Blaser, Sester & Egenhofer, 2000, p. 2). Urban planning can draw on this visualised GIS information to evaluate and (re-)design urban spaces in 2D as well as 3D (Zhou et al, 2004, passim).

The use of CAD applications has become commonplace in architectural and design practice, particularly in the design stage where it allows easy manipulation of concepts and the presentation of multiple variants. Due to the success of these applications there are now calls for their use in not only design but also built
environment evaluation in order to provide richer data during project stages such as public consultations (Laing et al, 2004, passim). CAD applications can simulate forces in buildings, structures and materials to judge the integrity of said structure during both design and evaluation processes through so-called Building Information Modelling (BIM) (Azhar & Hein, 2008; Succar, 2009). In a conservation context, the visualisation or three-dimensional recreation of buildings and archaeological sites is not only valuable in an archival respect, but can also allow researchers to compare buildings across the globe and access virtual representations of sites in what would otherwise be inaccessible geographical locations (Gutierrez et al., 2004).

The multitude of examples of visual information dissemination of which but a few were mentioned here support Kraidy’s claim that computers herald ‘the return to a visually based thought process’ (2002, p. 103). She builds her claim on Bailey’s concept of the ‘Leonardo loop’: a computer-instigated return to a parallelism of text and image as it was perpetuated by Leonardo da Vinci, for whom science and art, word and image were interchangeable (Bailey, 1998, p. 22). He argues that Leonardo’s work was not published in his time as it was unprintable by the (then) new dominant (mass) medium, the letterpress. ‘The printing press drove a five-hundred-year wedge between science and art, pushing the latter to the brink of extinction in the curriculum’ (1998, p. 21). However, Bailey sees a certain mitigation in this process through computers, which due to their ease of communicating images are argued to potentially bring about a change in the value of images as conveyors of information equal to text (see also: Metros, 2008, p. 102). In terms of the author’s own online information procurement processes, this certainly rings true. Paradoxically, while computer generated images can explain abstract concepts, they simultaneously further ‘conceptual abstraction by promoting virtual representations instead of reality’ (Kraidy, 2002, p. 103). This is reminiscent of Walter Benjamin’s authenticity concept (see p. 16).

**Visual literacy** can be defined as ‘the learned ability to interpret visual messages accurately and to create such messages’ (Heinrich et al., 1999, p. 64). According to
Avgerinou and Ericson (2002, pp. 280-83), visual literacy is a concept which is defined according to the respective context it is used in, and as vision is such a prevalent feature of our sensory experiences, the contexts are manifold. At its heart stand all aspects of visual communication. Stafford argues that in the 18th century, visual literacy was considerably better than it is today (1997, p. 24), but offers no concrete examples. However, this notion certainly rings true if one considers that upon encountering an image with unclear meaning, one is nowadays immediately looking for a written explanation rather than studying the image itself. To be “only looking at the pictures in a book” is has long been considered an insufficient way of reading information. As a society’s predominant mode of literacy depends on the predominant medium for information dissemination (Sinatra, 1986), it is comprehensible how print literacy in a contemporary context is still largely dominant but is being increasingly supplemented with visual literacy in an increasingly image-dominated world.

The definition of visual literacy offered by Heinrich et al. (previous page) suggests that it is a skill which has to be learned. Basic visual abilities (or visual-spatial thinking) develop, similarly to speech, from birth, although it is acknowledged that visual cognition precedes verbal communication in human development (Mathewson, 1999, p. 33). A child acquires visual abilities through use (Stokes, 2001), which ties in with findings that children who spend a lot of time in virtual 3D environments such as computer games showed increased skill in manipulating three-dimensional objects in their mind (Gunter, 1998, in Hostetter, 2006, par. 7) and better spatial memory (Champion, 2008, p. 215). However, the ability to navigate an image-rich environment without being able to create meaningful imagery does not automatically indicate visual literacy, just as the ability to read without being able to articulate oneself in a written form does not indicate literacy as such (Metros, 2008, p. 103). The development of higher order visual literacy in students is significant for built environment education not only in its obvious relation to plans and photographs of buildings, but also in its multi-source
(non-linear) application (see above) which is in keeping with the holistic learning environments propagated in section 2.2.1 (p. 34).

One skill closely related to visual literacy and arguably highly significant for a built environment professional is **spatial cognition** or spatial ability. Sutton and Williams define spatial ability as the ability to mentally rotate objects, understand how objects appear from different angles and how objects relate to each other in space (2007, p. 3). This aptitude to perform spatial tasks is considered an important aspect of human intelligence (Wang, Chang & Li, 2007, p. 1944) and goes back to Piaget’s theory of cognitive development, according to which spatial abilities develop from early childhood through interaction with the environment (Piaget & Inhelder, 1973; Wilson, 2002). Potter and van der Merwe (2001) report on the strong connection between spatial ability and learner’s achievements in subjects such as engineering drawing, which can be likened to the visual aptitudes required for built environment professionals in their day-to-day dealings with spaces. They also conclude that the level of inherent, pre-training spatial abilities vary from student to student (2001, p. 6). Sutton and Williams tested for this innate spatial ability in groups of HE students both with and without previous experience in technical drawing, and although the scores of the more experienced group were higher, both groups showed levels of innate spatial ability higher than expected (2007, p. 10). Considering that this study was published in 2007, at which point HE students would have already grown up as “digital natives”, this result may in part be attributed to the familiarity of these students with highly visual, possibly 3D digital environments as discussed above, although there is as of this day no scientifically conclusive evidence to support this.

Visual literacy and spatial cognition are thus skills which are valuable for built environment professionals, and which can be improved and trained through interaction with visual material and (virtual) three-dimensional spaces. In a contemporary, digital context, Wang et al. (2007, p. 1954) suggest that interactive 3D learning environments have a better capacity to motivate and engage students.
compared to similar contents presented in two-dimensional scenarios. The success of visuals over text for learning and their use in teaching is supported by cognitive science research (Hicks & Essinger, 1991, in Metros, 2008, p. 105) as well as shown to be effective in several studies reviewed by Stokes (2001). As mentioned on page 53, non-linear media such as computers are powerful tools to deliver complex contents, and should be well suited to the development or improvement of spatial awareness alongside conservation skills in the proposed Conservation Game. In higher education, digital media have found their way into every classroom, every lecture theatre, with mixed success – its applications range from the previously mentioned almost proverbial death by PowerPoint to highly immersive, interactive and learner-centred learning environments. As the focus of this thesis lies in the exploration of a game based learning environment for built environment HE, applications which are simply digital adaptations of traditional instruction techniques (such as PowerPoint slides) are marginalised in this chapter.

While the use of digital (3D) applications, even games, as an educational tool for exploration and experimentation is relatively accepted in architecture education (see: Agapiou, 2006; Al-Qawasmi, 2005; Clayton, Warden & Parker, 2002; Radford, 2000; Steele, 2001), the wider built environment education sector is only gradually embracing these technologies. The role of spatial cognition and abstract thinking which is vital for architectural practice should be similarly valued in non-design orientated built environment practices (Horne & Thompson, 2008, p. 6), who after all operate in the same physical environment. Frank suggests that built environment students value ‘hands-on, practice-relevant education, seeing things with your own eyes, [...] experience, team-working and tactile, emotional experiences’ (2005, p. 23). All these aspects of rich learning can be provided by interactive digital or virtual learning environments.
At the University of Northumbria, a Virtual Reality (VR) laboratory was installed and introduced into the School of the Built Environment in 2005, and several applications were developed cooperatively by staff for use in built environment exploration and teaching (Horne & Thompson, 2008, p. 8). The applications now support a range of subjects from architectural technology to property marketing, surveying to evolution of the built environment and professional practice (p. 13). Horne and Thompson report positive feedback from both staff and students in support of Mantovani’s (2003) claim that VR contributes to increased student interest and motivation due to the learning taking place in an experiential framework.

In a non-digital example, Forsythe reports the use of a lecture-supplemented physical model-making game to explain and explore construction processes and project management skills at the University of Technology Sydney, Australia. Activities involved model building and relevant project management processes were enacted in role play situations (2009, pp. 62-66). Similar to Horne & Thompson, Forsythe reports high levels of student motivation and attention (p. 71). Although the hands-on quality of physical model building as a collaborative activity has its own attractions and value, there is no reason why such a project could not be equally successful in a digital environment.

If one was to mesh together a solid learning theory with good pedagogical practice, the benefits of experimentation through simulation and the immersive motivational nature of games, a powerful educational tool could be created to suit any subject area in built environment education. The following section looks in detail at just such an approach, Epistemic Games, proposed by David W. Shaffer.

21 Virtual Reality: term for computer-generated visualisations of real or fictional environments which can simulate one’s physical presence in said environment
2.3 Games for Educational Built Environment Practice

Game studies, and indeed the study of the interaction between games and learning and the potential use of digital games in education has over the past decade grown into an academic discipline of considerable following and growing influence (Arnseth, 2006). It is not within the scope of this thesis to offer a full review of the by now copious literature on games-based learning, as this has been comprehensively achieved by others on a number of occasions (see for example: Aguilera & Mendiz, 2003; Kirriemuir & McFarlane, 2004; O’Neill, Wainess & Baker, 2005). This section of Chapter 2 will explore the fundamentals of games and learning and touch on those aspects of game-based learning which are most relevant to the thesis as well as the educational and psychological background to games in learning. Shaffer’s programme of Epistemic Games will be reviewed in greater detail. Together with the issues and considerations discussed to this point, this will build the theoretical basis for the Conservation Game proposed in Chapter 6.

What is a game?

Before examining the role of games in learning and the ways in which they can be harnessed for informal learning and formal education, one should perhaps look at a definition of game as a concept. Indeed, definitions of the term are as numerous as the people using it. However, there are a number of common elements which define games, or rather set them apart from other forms of entertainment.

Crawford classifies a game as ‘a closed formal system that subjectively represents a subset of reality’ (1982, p. 7). “Closed” here refers to the game as a self-sufficient entity, while “formal” indicates the presence of explicit rules. “Subjective” denotes that while a game will not be a representation of an objectively real situation, the same situation (the game fantasy) will be subjectively real for the player within the game context. Habgood (2007, p. 13) offers a more concise definition of games as ‘an interactive challenge […] undertaken for
entertainment’. Both authors are predominantly writing about digital games, yet while both definitions touch on significant aspects and elements of games, neither offers a complete picture. Indeed, the Austrian philosopher Wittgenstein argues that while one may perceive a number of similarities between different types of games, the range of activities to which the term is attributed is too great to devise a rule to define and govern them all (1953/1968, aphorism 66). Habgood’s definition mentions challenge and interactivity, which are generally considered important aspects of a game. Without interactivity, a game would be a simple, passive narrative, and from interaction arises challenge, conflict and struggle (violent or non-violent) (Crawford, 1982, p. 12). In his definition, Habgood omits the necessity for having a set of rules to structure a game. Although there are informal ways of playing, where rules are deliberately vague or made up spontaneously, like in the play of small children, rules are a key component to all mainstream games, both traditional and digital. The omission of rules in Habgood’s definition is particularly striking because his work is purely focused on digital games, which by default require a strictly set framework of rules and constraints to be programmable, let alone playable.

Not all types of play are necessarily entertainment, as Crawford points out by the example of lion cubs play-wrestling to learn essential life skills (1982, p. 14). Yet certainly as far as the human realm is concerned, and particularly in the present day where digital games and their respective advertising pervade day-to-day life, games are very much, if not exclusively associated with entertainment. However, there is a growing appreciation for the power of digital games both in regards to un-mentedored, often unconscious learning as well as formal education (Van Eck, 2006, p. 17).

Within the confines of this thesis (and unless stated differently), game designates a challenging subset of reality, digital or analogue, the interaction with which is governed by a formalised rule structure. As the primary focus of this thesis lies in harnessing games for education rather than entertainment, the
entertainment aspect has been consciously omitted from the above classification of the term *game*.

Since its birth in the 1960s and particularly since the rise of home computers in the 1980s (Hostetter, 2006, par. 4), the video game industry has seen a meteoric rise to power and with ever more intriguing technical possibilities, its growth is not likely to end anytime soon. Digital gaming (here including computer as well as console and mobile games) is now a hugely influential industry with projected worldwide revenues of over $68 billion for 2012 (Caron, 2008), closely rivalling both the film and music industries in competition for top spot in the entertainment sector. Figures presented by the Entertainment Software Association (ESA) in 2010 show remarkable annual growth figures for the US market of up to 6 times that of the overall US economy in recent years (Siwek, 2010, p.1). The average gamer is 35 years old, and with over 26% of all gamers older than 50 there can be no doubt that contemporary digital games are much more than child’s play (ESA, 2008, p.2). While these particular figures are taken from studies of the US game market, the impact of digital games on the entertainment sector is not an isolated phenomenon but stretches across the globe (Kolodny, 2006). Games are fascinating due to the possibility, and indeed the necessity of interaction, which sets them apart from stories because a player has active influence on events in the game. Crawford claims that *‘the most fascinating thing about reality is not that it is, or even that it changes, but how it changes, the intricate webwork of cause and effect by which all things are tied together’* (Crawford, 1982, p. 9).

While the bulk of the above figures are describing commercial games, most of which have not been intentionally designed for instructive purposes, the author supports the now common belief that games, and here particularly (but often controversially) digital games, have a place in (formal) education (see for example: de Freitas, 2006; Garris, 2002; Gee, 2004; Gros, 2007; Kiili, 2005). It has also been discovered that playing commercial games, and here mostly cooperative online games, can contribute to increased soft skills such as team leadership,
communication, decision-making under pressure and adaptability to fast-changing situations (Reeves, Malone & O’Driscoll, 2008). An increasing number of publications and conferences on the topic of video games and their application also testify to a growing academic interest in the topic and to the fact that video game theory is beginning to be developed as an academic field (Wolf & Perron, 2003, p. 13). Among these emerging debates, the discussion around the use of games for learning is one of the most prominent.

(Digital) Games in Learning

Relating to the above mentioned examples of young animals at play, Crawford claims that games are ‘the most ancient and time-honored vehicle for education. They are the original educational technology, the natural one, having received the seal of approval of natural selection.’ (1982, p. 15). In the light of this, he argues that compared to games, schools are the new, untraditional form of education, the ‘untested fad’ (p. 15). While this is no uncontroversial statement, it throws up interesting considerations about the value of play in life and further serves to illustrate the passion with which games in education are often advocated and defended.

Although Crawford’s publication offers no academic references, it is likely that his position builds on Huizinga’s pivotal text on the social theory of play, Homo Ludens (1949). Albeit outdated in some respects (particularly in the choice of vocabulary in regards to what would today be called sensitive subjects), Homo Ludens continues to be a highly influential work through its extensive anecdotal evidence of play in all aspects of life and society. In a similar way, Boellstorff speaks of game cultures and cultures of gaming (2006, p. 33), as does Raessens of a ludification of culture (2006). Far from its common association with children, Huizinga presents play as an underlying force in almost all aspects of human culture. Such play is harnessed into games by the application of rules, and games have been
educational tools for thousands of years (Coleman, 1971; Hostetter, 2006; Rieber & Noah, 2008).

Computer-based simulations have been in use in HE since the middle of the 20th century (see Cullingford, Mawdesley & Davies, 1979; Greenblat, 1973), and their effectiveness as tools for experiential learning is largely uncontested (see for example: Bradley & Postlethwaite, 2003; Reid, Zhang & Chen, 2003). It is worth noting at this point that the terms simulation and game are often used interchangeably. While they are similar in that both centre around the imitation of real or imaginary systems or processes, games also include a level of competition – ‘the object of a game is to win. In contrast, the chief aim of most simulations is to put a player in a specific role’ (Rieber & Noah, 2008, p. 80). Games are thus generally seen as a sub-set of simulations (Feinstein, Mann & Corsun, 2002; Hsu, 1989).

Despite the success of straightforward digital simulations, what really excited educationalists was the immense power of engagement demonstrated by video games such as Pac Man (Bowman, 1982, p. 16). Particularly in the 1990s, the surge of CDROMs as learning tools attest to the great belief that the combination of education and entertainment (later termed edutainment) would transform education forever. In 1995, educational software was the primary stimulus for home computer purchases (Hogle, 1996, p. 3). However, it is now widely understood that these applications, which in many aspects were nothing more than colourful digital textbooks and computerised quizzes, failed to harness the power of games effectively (see Kirriemuir & McFarlane, 2004; Papert, 1998). While the use of digital games in education had been inherently controversial from the start (Oblinger, 2006, p. 1), this development fuelled further criticism on educational games. Apart from studying and criticising negative behavioural changes alleged to playing games (see for example: Colwell & Payne, 2000), one main point of criticism builds on Huizinga’s separation of play and ‘ordinary life’ (1949, p. 28), of

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22 Early formal games were used to teach war strategy and tactics (for example Chess)
seriousness and fun (Garris, Ahlers & Driskell, 2002, p. 459). The undisputable immersive-ness of games is believed to distract players from learning educational contents embedded in a game (Arnseth, 2006, par. 9), while being forced to play a game in an educational context automatically defies the purpose of play (par. 41).

On the other side of that argument, enjoyment is often described as a key to effective learning (Crawford, 1982, p. 15). Although it has been suggested that learners derive pleasure from exploring new knowledge in a challenging and rewarding environment (which can be likened to game environments) (Bludson, Reed, McNeill & McEarchern, 2003), the notion of edutainment unhealthily ‘depends on an obsessive insistence that learning is inevitably “fun”’ (Okan, 2003, p. 255). Bloom and Hanych (2002) fear that serious learning can become trivialised if students are inundated with the belief that if they are not enjoying themselves, they are not learning, particularly as ‘post-secondary education is not usually a fun undertaking’ (Okan, 2003, p. 259). However, there is (anecdotal) evidence that students can very much distinguish between learning and playing for entertainment (Kirriemuir & McFarlane, 2004, p. 14). Rea suggests a diplomatic middle path between chaos in the classroom due to an excess of fun, and boredom and apathy caused by strictly ordered, ‘deadly serious’ education (1997, p. 4). He describes the ideal system for motivating students as serious fun, which is defined as play with a purpose: using whichever means (including games) to enhance student engagements without losing sight of the serious learning outcomes (p. 20). Although his suggestions are targeted towards the school classroom, there is no reason why similar principles should not also apply to post-secondary, higher education. Indeed, the Conservation Game builds firmly on the concept of serious fun (as discussed in Chapter 6).

Currently, a second wave of research into the educational purposes and capacities of games is largely supportive of Rea’s approach. While early digital-games-in-education research had the tendency to polarise strongly between heated arguments for and against game-based learning or –teaching (a behaviour the
contemporary internet community would call “flaming”\(^{23}\)), the continuing and indeed ever increasing (commercial) success of digital games has led to a renewed interest in serious games both within the academic community and the game industry (see Habgood, 2007, p. 14). Van Eck humorously comments on this sudden support: ‘Like the person who is still yelling after the sudden cessation of loud music at a party, DGBL [digital game-based learning] proponents have been shouting to be heard above the prejudice against games. But now, unexpectedly, we have everyone’s attention.’ (2006, p. 17). Yet, as he goes on to say, while the notion of DGBL has become increasingly accepted, the above need to shout meant that educationalists and game researchers alike had focussed on proving the efficacy of games rather than researching why this is the case, and how DGBL could be effectively implemented (p. 18; see also: De Freitas, 2006, p. 5) – a reasonable assessment. The results of this lack of prescription within the DGBL research community becomes particularly apparent if one attends a conference such as the European Conferences on Games-Based Learning – the consensus being that there is no consensus. However, a set of commonly appreciated aspects of GBL can be observed from best practice approaches.

The experiential quality of games addresses the issue with practice-removed instruction thrown up in section 2.2 (from p. 34). Games can provide a meaningful context for learning (Arnseth, 2006, part. 1; Shaffer, 2009; Van Eck, 2006, p. 18) through their capacity for creating immersive worlds, be they representations of physical worlds or fantasy creations. Within games and simulations, players can have experiences which would be difficult or impossible to have in real life (Hostetter, 2002, par. 26; Oblinger, 2006) and although the topic of virtual experiences returns us to the issue of authenticity (see pages 16 and 31), the author firmly believes it better to have a virtual experience rather than no experience at all. These experiences can also help players become articulate in what Gee (2003) calls a *semiotic domain*, related to Shaffer’s *epistemic frames* (2004a; 2006; see also section 2.3.1, p. 70) – an understanding of skills and communication within a certain

\(^{23}\) “Flaming” (internet jargon): hostile and at times insulting interaction between internet users of differing opinions; occurs typically on forums and discussion boards
(professional) environment. Repetition, a key ingredient in digital games and indeed most activities in life (Coyne, 2003) anchors this understanding in the minds of the learner, true to the ancient Latin proverb repetitio est mater studiorum – repetition is the mother of learning (see also Attewell, Suazo-Garcia & Battle, 2003, p. 280).

One commonly acknowledged problem with game-based learning and teaching is that games are very good at teaching players how to play the game; in many cases, commercial games which claim to be educational (such as popular brain training games) only teach players how to pass a cognitive test (Pivec, 2009, p. 318; see also: Rieber & Noah, 2008). Even in more complex games, it is often difficult for players to transfer the contents learned in-game into a different context, touching on the issue of transferable skills. Hogle links this with implicit learning, which is unconscious and the outcomes of which a learner is often unable to articulate (1996, p. 15). It is understood that the player/learner needs some form of reflective cognition in order for deeper levels of learning to be able to transfer beyond a game context (Rieber & Noah, 2008, p. 80; see also: Norman, 1993; Pivec, 2009). This reflection, which is often achieved through discourse with peers or teachers, helps the learner to organise contents into meaningful patterns. Here, parallels to educational patterns used in practica and internships (see page 38) can be observed.

ROLE-PLAY

Together with simulation, role-play\(^\text{24}\) is one of the commonly acknowledged success stories of using game elements in an educational context (Alden, 1999; Coutre, 1999; Ladousse, 1987; Oberle, 2004; Sleigh, 2004). In a study of UK higher education institutions, Lean et al. found role-play to be the most commonly used form of simulation-based learning (2006, p. 234). Role-play is a form of social

\(^{24}\) Although concerned with its application in game formats, “role-play” in the context of this thesis is considered distinct from the gamer term “role-playing”; “role-play” designates a comparatively loosely-bound social activity, whereas “role-playing” indicates a highly structured, turn-based format of character play which is tightly governed by extensive rule books (see for example: Dungeons & Dragons)
simulation, which requires players to put themselves in the position of a character and act out their part within the rule structure of a (fictional) situation. It can be linked to the principles of role theory, which suggests that all human behaviour is context-specific and that individuals act differently in one context (such as work) than they do in another (for example family) in accordance with social roles (Biddle, 1986). Role-play therefore builds on and assists the improvement of interpersonal skill through negotiation and compromise (Feinstein, Mann & Corsun, 2002, p. 39) and is often employed in the context of social science learning. Role-play scenarios are engaging and motivational through their employment of goal-oriented activities in order to create meaningful experiences and learning (Reich & DeFranco, 1994, p. 13). Additionally, Hyman argues that the game-like atmosphere of role-play and the contrast with traditional instruction methods contribute to its motivational properties (1978, p. 154).

Although simulations and role-plays are widely employed, a series of comparative evaluation studies have shown that they are no more successful on the account of students learning a subject than other, more conventional instruction methods (Pierfy, 1977). The strength of these methods lies in the aforementioned motivation of participants, the increase of retention rates of information learned and the increase of interest for the subject in participants (Druckman & Ebner, 2008; Bredemeir & Greenblat, 1981; Pierfy, 1977). As such, they are highly suited for raising awareness of and interest in a multi-stakeholder topic such as building conservation, and will be considered valid experiential learning environments in the design of the Conservation Game.

It is beyond doubt that (digital) games have immense power to engage a player and to prompt him/her to carry out often highly repetitive tasks willingly and indeed, happily (Ryan & Deci, 2000, p. 56). Since DGBL (digital game-based learning) research cannot (yet) be prescriptive about the design of educational game environments, it is all the more important to pair technological innovation with solid pedagogical approaches and clearly defined learning theories. The following
section discusses in detail such an approach, the application of which in the context of built environment education is highly feasible.

### 2.3.1 EPISTEMIC GAMES – TOWARDS A PEDAGOGICAL PRAXIS

David Williamson Shaffer has been working on the learning theory of Epistemic Frames and its subsidiaries, Epistemic Games and Epistemic Network Analysis (ENA), for a decade with very promising results. Building on constructivist ideals and Dewey’s works on linking education with society, Shaffer takes Dewey’s industrial approach of a century ago and translates it into a “postindustrial” educational practice (see terminology discussion p. 54) grounded in contemporary communication and information technology (Shaffer, 2004b, pp. 1401-2).

He developed a promising teaching strategy called Epistemic Games, a way of experiencing professional work environments through a form of digital practicum. In combination with Epistemic Network Analysis, these games can create a digital learning system – linking a theory of learning with a suitable, accompanying assessment model as part of a digital learning environment (Shaffer et al, 2009, p.33). These terms and their particular relevance to this research as design strategies for the Conservation Game will be discussed in detail in the following sections.

At the heart of Shaffer’s concept lies the suggestion of transforming education from teaching standardised contents with the aim of passing standardised tests to a more personally meaningful model aimed at developing creative, connected and critical thinking. He creates digital learning environments (Epistemic Games) in which children can explore the professional environments of city planners, geneticists, journalists and the like, and experience what it means to think and behave like a professional in the respective field (Shaffer, 2004a; 2004b; 2006; 2009). While Shaffer’s model is largely aimed at secondary school pupils, its relevance to adult education, and particularly university education, is considerable in so far as it can grow understanding of and limited expertise in a field related to, but not necessarily incorporated in the main curricula, thus broadening a student’s
horizon within his or her professional practice. The development of such (trans)professional vision, particularly in regards to architectural conservation, is strongly advocated by this thesis, rendering the concept of Epistemic Games highly relevant for this research, and particularly for the development of the Conservation Game.

Epistemic Frames and Games – Shaffer’s Theories and their Background

Epistemology in general is the philosophy of knowledge and its accumulation. In direct relation to the concepts of communities of practice (p. 41) and reflective practice (p. 41), Shaffer proposes his epistemic frame hypothesis (2004a; 2006), which suggests that every community of practice has a specific culture, which in turn is characterised by a grammatical structure of:

- Skills & Knowledge: what people know and do within that community
- Identity: the way members of the community view themselves
- Values: the beliefs held by members of the community

The elements within this structure are linked through Shaffer’s interpretation of Epistemology: the knowledge which allows actions or claims to be seen as legitimate within a community (Shaffer et al, 2009, p. 36).

The term epistemic frame stems from the combination of epistemology as a particular way of thinking and knowing with Erving Goffman’s (1974) concept of a frame as an organisation system for experiences and their relation to the actions of an individual or group. Metaphorically, frames hold together people’s “pictures”, the context of their experiences. An epistemic frame is therefore more than a collection of knowledge, interests, activities and affiliations – it constitutes particular types of “knowing” ‘that comprise, for a particular community, knowing where to begin looking and asking questions, knowing what constitutes appropriate evidence to consider or information to assess, knowing how to go about gathering that evidence, and knowing when to draw conclusions and/or move on to a different issue (Shaffer, 2006, p.227). The epistemic frame of a community, its particular way
of viewing and assessing the world, is internalised through the training given to new members of a community of practice and is, upon acquisition, employed by the new members as well.

Shaffer’s digital learning environments are modelled on professional practices, suggesting that each professional group is represented by distinct epistemologies. The theory of pedagogical praxis, an extension of reflective practice (see p. 41), builds not only on the way professionals know how to act in a professional environment, but also on the way they learn to do precisely that. It suggests that ‘the practices through which professionals learn may provide an alternate route to developing important habits of mind’ (Shaffer, 2004b, p. 1403), which in turn can become the basis for compelling learning models appropriate to address the challenge of creating transferable 21st century skills (p. 54).

Epistemic games build on the principles of pedagogical praxis in allowing learners to acquire relevant skills and knowledge in context, as well as introducing them to the epistemic frame of a community of practice. Drawing on learning theories and models which do not rely on the presence of computers, Shaffer transforms these ideas into contemporary digital learning environments which offer not only a rich learning experience but also a successful assessment method (see section 2.3.1, Epistemic Network Analysis, p. 74).

Epistemic games mimic professional practica digitally in an attempt to reproduce ‘key cycles of professional activity and reflective feedback’ (Hatfield, 2011, p. 16). Within a simulated and digitally mentored professional environment, students assume the role of a trainee professional and can experience the challenges and requirements of working within said professional environment. Through the development of digital simulations of professional practica, Shaffer’s Epistemic Games give students the possibility of learning.

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25 Epistemic Games have so far been developed to simulate the professional practices of urban design, graphic design (combined with mathematics), journalism, negotiation and biomechanical engineering (http://epistemicgames.org/eg/category/games/)
complex, higher-order skills relevant to contemporary society in a meaningful environment, which have been shown to transfer well into topic areas beyond those taught (Shaffer, 2004a; 2004b; 2006; 2009). They gain what the anthropologist Charles Goodwin describes as professional vision: the familiarity with a profession’s particular vocabulary, which allows the coding of situations, issues and problems in conversation and discussion, and the ranking of relevant and irrelevant options (Goodwin, 1994). Any professional in the multidisciplinary built environment sector would undoubtedly benefit from wider, more inclusive professional vision.

While a large amount of criticism has been levelled at the majority of so-called educational or serious games for being nothing more than digitalised drills or quizzes (Denis & Jouvelot, 2005), Epistemic Games do not really aim at creating experts. Although players will assume the role of a planning or journalism professional while playing the game, they will not upon completion be planners or journalists. What Epistemic Games do, and do very well, is to ‘facilitate the emergence of disciplinary thinking and acting that transfers to other contexts’ (Rupp et al, 2010, p.6). In other words, Epistemic Games provide an environment in which a student can learn how to think and act like a professional, building what Crowley & Jacobs (2002, p. 333) define as islands of expertise – topics children become interested in and develop a relatively rich knowledge about. This interest, coupled with the development of a certain amount of expertise, which is empowering to the learner, can create the basis for deeper learning in and beyond the respective topic area. After playing Shaffer’s Epistemic Games as part of various in-school as well as extracurricular trials, students not only had a better understanding of the game topic, but were shown to be more confident, better able to connect pieces of information, assess them critically and formulate an argument (Shaffer, 2004a; 2004b; 2006; 2009). While Shaffer himself admits that only limited conclusions can be drawn from the qualitative assessment of isolated student responses, the results are nevertheless promising and indicate deep learning (as in true understanding.
rather than the storage and regurgitation of information) and the development of transferable skills such as described above.

**EPISTEMIC NETWORK ANALYSIS**

In order to address the issue of reliability of results and prove the validity of his proposals, Shaffer developed Epistemic Network Analysis as a digital assessment system geared to the requirements of Epistemic Games together with a number of researchers and supported by the Massachusetts Institute of Technology (MIT) (Hatfield, 2011; Shaffer et al., 2009). It is part of the previously mentioned digital learning system, where a theory of learning is paired with a tailor-made evidence-based assessment method in a digital learning environment. In the case of Epistemic Games, which above all promote learning in context, the assessment (measuring the development of epistemic frames in students) also needs to take place in context. In order to give an accurate report of a learner’s progress, data needs to be comprehensive, but its collection should not interfere with or even disrupt the experience of play/learning (Rupp et al., 2010, p. 7).

As common with any form of complex learning, the evaluation of whether learning outcomes are being met is difficult and requires sensible alignment with learning contents and based on the evidence of a student’s performance (Spector, Christensen, Sioutine & McCormack, 2001, p. 517). While conventional standardised testing is not desirable or indeed particularly meaningful for the evaluation of non-standard skills, it is nevertheless useful to produce empirically computable data for each student which in turn permits comparison with other students as well as the learning goal. Large amounts of data have to be compiled for each individual learner to form an accurate picture of the learning progress. For such a scenario, the application of a digital learning tool is optimal as it allows the collection, storage and computation of vast amounts of information. As the inclusion of a viable assessment system into the thesis proposition is a vital aspect of this research, Epistemic Network Analysis as well as its background and influences will be covered in some detail in this section.
Evidence-centered Design

Since Epistemic Network Analysis (discussed in more detail from page 77), which has been judged as a valuable assessment model for the development of the Conservation Game, builds on the theory of Evidence-centered Design (ECD), the latter will be briefly presented here.

Developed by Mislevy, Almond and Steinberg to ‘support assessment developers in making explicit the rationales, choices and consequences reflected in their assessment design [...]’, it [ECD] is particularly suitable to the development of performance-based assessments that are created in the absence of easily delineable test specifications’ (Rupp et al, 2010, p. 8). Evidence-centered Design aims to create a design framework of sufficient generality to be use across a wide selection of assessment methods, which introduces a common terminology and provides a structure which links assessment design to the processes of assessment operation (Mislevy, Almond & Lukas, 2004, pp. 2-5). In other words, Evidence-centered Design offers a guideline structure for the development of assessment systems for and their application in nonstandard, complex learning programmes by carefully considering all aspects of a learning environment and its desired outcome.

Each assessment must start with a substantive analysis of the respective learning domain and the purposes of the assessment – as such, ECD is no different to general instruction design practices in higher education. ECD specifically helps to structure the target knowledge, its acquisition and the circumstances under which a student produces this knowledge into a workable assessment structure (Mislevy & Riconscente, 2005, pp. 8-10). The Conceptual Assessment Framework (CAF) (Figure 10), a key framework within the ECD structure, illustrates the guidelines for the development of the operational aspects of an assessment. For easier access and handling, the framework is structured into models which each address a particular aspect of assessment design and determine what is being measured where, and how (see also: Mislevy, Steinberg & Almond, 2003; Mislevy, Almond & Lukas, 2004; Mislevy & Haertel, 2006). The following overview over the Conceptual Assessment
Framework has been largely summarised from Mislevy, Almond & Lukas (2004, pp. 6-14) and Mislevy & Haertel (2006, pp. 10-15).

The **Student Model** describes the variables linked to a student’s knowledge, skills and abilities the assessor wants to measure. It illustrates the proficiency component in the measurement system and considers the existing skills and knowledge as well as the targeted learning outcomes of an exercise.

The **Task Model** serves to outline the environment conditions under which a student produces the evidence required for assessment. This includes the presentation material, the material given to a student as part of the assessment, and the work products, a student’s response to this material. It describes where an assessment takes place, the features of a task, and the nature of the relationships between said features and the respective presentation materials and work products.

The **Evidence Model** links the Student and Task Models by providing a system of evaluating a student’s knowledge based on the evidence produced in the task. This model is structured into two sub-models, *Evidence Rules* and *Measurement Model* (or Statistical Model). Evidence Rules summarise a student’s performance based on the *observable variables* produced from work products. In the Measurement Model, these observable variables are cross-referenced with the Student Model variables,
describing the ‘accumulation and synthesis of evidence across tasks’ (Mislevy, Almond & Lukas, 2004, p.10).

The Assembly Model describes the synthesis of Student, Task and Evidence models into an assessment structure. The final appearance of the assessment, the nature of its delivery and its potential embeddedness in other processes is determined in the Presentation Model. Together with the determination of how the interaction with the student is being handled during the assessment, these models come together in the Delivery Model of the final assessment as a product. Evidence-centered Design has been suggested as a valuable tool for the development of Epistemic Games and Epistemic Network Analysis (Rupp et al, 2010), and is thus considered within the proposed structure of the Conservation Game.

Epistemic Network Analysis theory and practice

The assessment of Epistemic Games must start with and evolve around the development of epistemic frames in learners. As epistemic frames are particularly powerful due to the connection between their respective parts (skills, knowledge, values, identities and epistemologies), any assessment of such an epistemic frame must incorporate looking for evidence of such connections rather than merely documenting the existence of skills, knowledge and values unrelated to each other (Shaffer et al, 2009, p. 37). Such assessment of epistemic frames is made possible by the adaptation of Social Network Analysis, an analytical tool for representing dynamic relationship networks. While Social Network Analysis was originally developed to describe the relationships between individuals and groups of people, its mechanics can be successfully applied to the evaluation of epistemic frame development.

When describing the link between Social Network Analysis and Epistemic Network Analysis, Shaffer and his colleagues (2009, p. 37) draw on the example of a party. If one wanted to study the dynamics of relationships between partygoers, one would, at appropriate intervals, take stock of who is speaking to whom about
what. The accumulation of every partygoer’s actions and interactions over time provides a representation of the social network relationships in play at the party. Similarly, one can record the actions and interactions of the players of Epistemic Games, their conversations, propositions, and reactions to certain stimuli, to develop an understanding of their learning progress. The data collected is a mixture of *process data*, which describes the nature of all player interactions (both with players and non-players), and *product data*, the accumulation of a student’s tangible work products (Rupp et al, 2010, p. 7).

Prior to the assessment design, each epistemic frame, the development of which is a desired outcome of an Epistemic Game, must be analysed for its key components, the type of skills, knowledge etc. a player should acquire. In the example of one of Shaffer’s games, which focuses on design engineering, these components could be ‘*the skill of comparing design alternatives (S\CA)*, *the values of designing to meet a client’s needs (V\CN) and producing reliable designs (V\RD), and the epistemology of making judgements based on quantifiable tests of performance (E\QT)*’ (Shaffer et al, 2009, p. 38). While the game is being played, evidence of a student’s use of one or more of said components can be collected at a point in time – a regular interval, or a specific event in the game. This can be achieved, for example, through the coding of text passages written by a student. For each individual player, this data can be accumulated into a *play history* for the participation in the game.

Through the documentation of the presence of certain epistemic frame components at a certain point in the game, one can construct a network graph in accordance to the Kamada-Kawai spring-mass model\(^\text{26}\). This graph illustrates the relationship between the frame components in use, or, in analogy to the party, shows which partygoers are speaking to each other, and which have not yet arrived

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\(^{26}\) A spring-mass model is a specific algorithm for generating graphs whereby the arcs are treated as springs and the nodes as if they were electrically charged to create a system of attraction and repulsion until an equilibrium is achieved, which is then visualised. For technical details on the Kamada-Kawai model, see Kobourov (2005)
or are in a different room. The frame components are represented as nodes (circles) in a network graph, and are linked to each other by arcs (lines) (Figure 11). Components not in use are shown as nodes without arcs. ‘In technical terms, a network graph [...] represents the epistemic frame in use by player p in the strip of time t based on the evidence in our data set D’ (Shaffer et al, 2009, p. 39).

Figure 11: ENA: example of simple network graph (a student’s graph in one of Shaffer’s Epistemic Games)

If the snapshot graphs (those taken from certain points in time) are combined, a cumulative network graph (Figure 12) can be produced which shows connections frequently made during the game as closer together than such not made as frequently. This is visualised by the respective length of the arc, which is inversely proportional to the frequency of connections made. Certain elements will be grouped tightly, while others are more remote. This corresponds to the way a professional is viewing his world according to a clear understanding of the relationships between and relevance of certain aspects of said world. Indeed, the comparison of respective epistemic network graphs suggests that after playing an epistemic, game a student’s understanding of a subject becomes comparable to that of a field expert (Shaffer et al, 2009, p. 40), attesting to the validity of this educational approach.
While such network graphs provide a powerful visual tool for the understanding of a student’s epistemic frame development, the data needs to be quantified to be able to make accurate inferences. This can be achieved by computing the weighted density\textsuperscript{27} of an epistemic framework at a point in time, which provides ‘a measure of the overall strength of association of the network, emphasizing the dense core of the graph as being central to the strength of the epistemic frame’ (Shaffer et al, 2009, p. 40). This data can be used to measure the changes in a student’s epistemic frames over time, which in turn can be associated with specific game elements or points of game play. It thus provides a measure not only of how much a student has learned, but also of how and where this learning occurred in the process of playing an epistemic game.

\textbf{Summary of Shaffer’s Learning System and criticism}

The Epistemic Frame hypothesis together with its practical learning and assessment applications of Epistemic Games and Epistemic Network Analysis

\textsuperscript{27} ‘The weighted density is calculated as the square root of the sum of the squares of the associations between individual elements in the frame’ (Shaffer et al, 2009, p.40). For more detail on computation, see Shaffer et al (2009), appendix
represent a valuable example of a complete digital teaching tool, which can be applied to any professional domain relying on praxis learning. Due to the complexity of the system, and the corresponding length of this chapter, the spheres of influence, the corresponding theories and ideas which affect Epistemic Games have been summarised in a concept map in Figure 13 (p. 81).

Central to this construct of ideas lies the tripartite which constitutes Shaffer’s digital learning system: Epistemic Frame hypothesis as the theoretic backbone, Epistemic Games as the practical learning tool and delivery vessel, and Epistemic Network Analysis as the evaluation tool. Epistemic frames draw heavily on the principles of working and learning in context, and developing expertise within a community of practice as part of a professional practicum or internship. If applied to students, who despite playing the role of a professional are not expected to fully master a professional domain as part of their game play experience, will nevertheless develop islands of expertise within and around that domain.

![Figure 13: Concept map: Theoretical influences on Epistemic Games](image)

Epistemic games are designed to foster the development of epistemic frames similar to those a practitioner or domain expert might exhibit. In order to evaluate the stages and progress of this development, Epistemic Network Analysis has been
developed as a derivate of Social Network Analysis. It draws on the principles of Evidence-centered Design to measure a player’s use of epistemic frame components during game play and conflates a mass of pinpoint data into graphs which demonstrate a player’s development and strength of epistemic frames.

Note on state of development and reliability of system

Compared to Collins’ and Ferguson’s early description of Epistemic Games as a ‘set of rules and strategies that guide enquiry’ (1993, p. 25), played with lists and graphs using pen and paper, Shaffer’s digital approach seems more multidimensional and engaging, although it builds on a similar appreciation of Epistemic Games as ‘a powerful tool for making sense of different phenomena in the world’ (Collins & Ferguson, 1993, p. 39). Although Sherry and Trigg (1996) as well as Tuminaro and Redish (2007) endorse Collins’ and Ferguson’s basic Epistemic Games (the latter without reference to Shaffer’s work), Shaffer’s research is rendered prominent through busy publication activity since 1997. While the successful development and testing of his particular brand of Epistemic Games has been an ongoing project for Shaffer and his colleagues of the Epistemic Games Group at the University of Wisconsin-Madison for the past decade, the games are not yet commercially available, thus limiting the amount of their exposure to general criticism. Although Shaffer is frequently referenced in connection with the general use of (digital) educational games in school settings (see for example Kebritchi, 2010), no direct criticism of his work could be found. Hayes and Games (2008), Squire (2008) and Williams (2008) all quote Shaffer’s epistemic games as a positive example for experiential game-based learning and teaching strategies in the context of both instruction and assessment design for complex learning.

Although Epistemic Games have been a steady success in engaging students in a meaningful learning environment and growing transferable skills since their conception (Kirriemuir & McFarlane, 2004), the respective assessment system is relatively young and has not yet undergone testing on a large scale. Epistemic Network Analysis (ENA) nevertheless shows promise as a viable and workable
proposal in conjunction with Epistemic Games. It enjoys the backing of a number of respected researchers as well as MIT, which should speak for its quality. The Epistemic Games Group currently features 41 researchers across a number of US universities, not taking into consideration prominent advisors such as James Paul Gee and a large number of university graduates\textsuperscript{28}. Furthermore, David Hatfield (2011) worked with the Epistemic Games Group on validating ENA as part of his PhD research, and his findings unanimously support the validity of Epistemic Games as a successful method of developing professional epistemic frames in students and of ENA as a meaningful tool of tracking and evaluating this learning process. As such, both Epistemic Games and ENA have been tested within the means of contemporary digital technology and have been judged valid models for the development of the Conservation Game.

2.4 Summary

Due to the considerable length of this chapter, the themes most directly relevant to this research project are summarised briefly in this following section.

As outlined in Chapter 1, this project aims at improving the perception and understanding of architectural conservation in undergraduate UK built environment students through the development of (the theoretic framework for) a Conservation Game as an interactive learning environment. Heritage protection, and with it, architectural or building conservation, is a much-discussed, much-contested and frequently emotional topic in the light of economic hardship, cultural development and long-term sustainability. Regardless of one’s own stance in this debate, it is undeniable that heritage (and consequently by its very nature, heritage protection) matters, both in emotional and economic terms, as evident from the omnipresent discourse about its diverse values (Cameron, 2006; Kerr, 2000; Throsby, 2001). The initial attribution of value to artefacts leads to the designation of heritage, while the key to its protection in turn lies in the continuing attribution of value to said

\textsuperscript{28} See Epistemic Games Group staff on \url{http://epistemicgames.org/eg/category/people/}
The emotional power of heritage is rooted in its ability to foster identity, its evidentiary quality which provides a measure of metaphysical stability, or simply its age, rarity or beauty (Graham, Ashworth & Tunbridge, 2000; Grenville, 2007; Jedlowski, 2001). Such values are commonly considered cultural values, which in turn inform the more practically- (or, as some would say, capitalism-) oriented economic values evident in the strong demand for items of character, and a consequently large price tag. In the built environment, this is mirrored in increased property value (despite higher maintenance cost) and a general trend towards heritage-led regeneration (Amion Consulting, 2010; EH, 2000; EH, 2009a).

Despite its presence in the media and on the streets, where it is more obvious but often leaves less of an impression, architectural heritage and a true appreciation of its protection and management does not generally grow by itself but has to be cultivated through education. Heritage protection organisations as well as a small part of the higher education sector have taken it upon themselves to provide this education, which upon closer inspection despite best intentions nevertheless reveals what the author considers a serious flaw in their targeting strategies. In the UK, general heritage awareness education has been discovered to be almost exclusively aimed at young children, while on the other end of the spectrum, building conservation training is provided very specifically for aspiring conservation specialists and interested practitioners in the form of highly specialised Continuing Professional Development (CPD) courses (see section 2.1.3, p. 34). Despite the fact that the historic built environment has an enormous impact on the property and construction sectors in the UK and report after report calls for a broader base of conservation specialists (Baker & Chitty, 2002; NHTG, 2008; Preston, 2002), very little provision is made to cater for those aspiring built environment professionals still in formal education. These students will have a potentially huge impact on the built environment (and with it the historic environment) but are not commonly introduced to building conservation as a philosophical concept as well as a practical process during their formal education.
As demonstrated in Chapter 4, the author identifies this group as the ideal target group for the Conservation Game.

The Conservation Game, a digital interactive learning environment aiming at introducing students to the concepts and processes of conservation and heritage-led regeneration, is modelled on the principle of David Shaffer's Epistemic Games (2004a; 2006; 2009). Epistemic Games simulate the way new professionals learn from mentors and their work environment in a form of digital practicum, a system of learning called pedagogical praxis (Shaffer, 2004b). Pedagogy in this context refers to both child and adult education, as the latter has never been shown to significantly differ in principle from the former (Hartree, 1984; Smith, 1996). Through interaction with and feedback from their work environment and mentors, learners acquire the necessary skills and knowledge, attitudes and professional judgement relevant to their field and identify with their professional circle. The totality of skills and knowledge, identity, values, and the ability employ all of those adequately, constitutes a professional epistemic frame (Shaffer, 2004a). Epistemic Games operate on the principle of growing epistemic frames in students which are similar to those of professionals.

The theoretical framework behind Epistemic Games is rooted in Dewey's early 20th century campaign to link education with society through practical learning (1915; 1938; 1958) and as such builds on the principles of Kolb's (later formulated) experiential learning theory. According to Kolb (1984), the construction of knowledge through experience relies in equal measure on the aspect of grasping said experience and the aspect of transforming this experience in one's mind through reflection and experimentation. Reflection often occurs through conversation with mentors or peers, which for any profession build specific communities of practice (Lave & Wenger, 1991), each of which in turn operates within its own distinct epistemic frame. Through an initially guided cycle of action, feedback and reflection, new professionals acquire the ability to integrate the process of reflection into their immediate workflow, thus achieving reflection-in-
action (as opposed to reflection-on-action) (Loughran, 2002; Russell, 2005; Schön, 1983).

Both the theories of experiential learning and reflective practice as well as the related approach of practical learning through internship or praxis are prominent themes in contemporary built environment education discourse. Epistemic Games draw on all these aspects and integrate them into a flexible, digital learning environment which by virtue of its immersiveness and direct relevance to professional practice is not only enjoyable but has also been shown to successfully grow epistemic frames.
3 - METHODS

3.1 Introduction

While the aim of this thesis has always been to put forward a workable proposal for the promotion of building conservation awareness training and its integration in undergraduate built environment degrees in the United Kingdom, there is very little factual evidence which allows informed judgment on the nature, quality and extent of current building conservation education practice. As the Conservation Game is intended to be applicable on a nationwide scale, it seemed imperative to establish an image of said building conservation education practice as a knowledge working base prior to formulating any specific proposal.

It has to be acknowledged from the start that due to the independent nature of higher education institutions (HEIs) in the UK, the field from which data was to be collected is highly diverse and complex as well as constantly subject to change, not least in the light of the current (as of 2011/12) reforms to the English university system (see Government White Paper Students at the heart of the system, June 2011). What is applicable for one institution does not necessarily refer to another, and although all institutions adhere to national codes of standards such as the Quality Assurance Agency’s UK Quality Code for higher education, the publicly available information about specific degree contents, particularly details, is often inconsistent, not only between institutions but also between faculties and schools/departments within an institution. In an address to staff (June 28, 2011), John Craven, Vice-Chancellor of the University of Portsmouth, commented on the relative obscurity of available course information across the board and agreed with the then newly proposed increased transparency of higher education as put forward in the Government White Paper: Students at the Heart of the System (2011).
3.1.1 RESEARCH QUESTION

The overall research question for the thesis project has been formulated as such:

*How to adapt generic conservation education contents in an interactive, playful, problem-based learning environment which can be adopted by HEIs (Higher Education Institutions) across the UK to teach basic real-life conservation awareness, appreciation and project management skills.*

The investigation into current building conservation education practices as presented in Chapter 4 addresses a large part of this research question by studying the status quo of actual building conservation education in terms of its presence, practical application, contents and teaching methods on the one hand. On the other, it investigates such influences on HEIs as can determine the nature and extent of building conservation education in built environment degrees. It studies the reality of conservation education as it is in general as well as specific issues arising with its planning and delivery.

The aspect of non-uniformity of the study field, as well as the multifaceted research question, rendered a single method enquiry too rigid and thus unfeasible. The decision was made to employ a mixed-method approach with qualitative focus in order to be able to describe the field of building conservation education in undergraduate built environment degrees in all its complexity, taking into account any arising influences, necessities, restrictions and opportunities relevant to the field, and thus relevant to the thesis proposal. The theoretical basis of this mixed methods research approach is discussed in the following section, while its practical application for this thesis is outlined, as previously mentioned, in Chapter 4 (p. 102).

In the following, built environment course or built environment degree will be used interchangeably, and will describe such degree-level study programmes as exhibit a close connection to the evaluation, development and management of the built environment and/or are concerned with the execution of design - these
include course topic areas such as areas such as property, surveying, real estate and construction management. Such programmes primarily involved in the creation of design in the built environment (architecture, etc.) shall be called *architectural design courses* and shall be omitted from this study (for selection criteria see the course inventory in Chapter 4.2.3, p. 107).

### 3.2 Methods – theory

As previously demonstrated in Chapter 2, little research is being done in regards to building conservation education in HE, and particularly as part of built environment undergraduate degrees. In order to be able to paint a comprehensive picture of current building conservation education practice, its extent, nature and justification, a mixed methods study design was chosen for this project. Due to the nature of the thesis, the following review of relevant literature focuses largely on the claims made to quantitative, qualitative and particularly mixed research methodology in the contended arena of social sciences.

Fundamentally, the mixed methods researcher employs more than one research method in its study design, involving the gathering, evaluation and combination of data from different sources in order to obtain a more comprehensive result than would have been possible by the isolated use of a single method (Thomas, 2003, p. 6). While the term ‘mixed methods’ can refer to the use of more than one quantitative method, or similarly, more than one qualitative enquiry, it is most commonly understood to designate a combination of elements of both quantitative and qualitative data (Brannen, 2008, p. 53). Within the confines of this thesis, mixed methods research stands for a combination of quantitative and qualitative approaches.

The merits of quantitative research designs have been widely discussed in a most pertinent fashion elsewhere, and will not be presented in particular detail here. However, it is worth mentioning that quantitative research generally seeks
objective results which are generalisable over (a segment of) the wider population through the analysis of large amounts of standardised data. Personal contact between researchers and participants is undesirable due to the potential contamination of the data (see Thomas, 2003, p. 1-2). While it is now generally acknowledged that any form of data analysis involves interpretation, thus moving from a realist perspective towards the realm of hermeneutics\textsuperscript{29}, quantitative or quantifiable data is still perceived as the scientifically more valuable (Robson, 2002, pp. 19-21). However, in social sciences the quest for total objectivity is rendered somewhat pointless as social enquiry can never be entirely value-free (Smith & Heshusius, 1986, p. 5). The establishment of facts and universal laws in social sciences is greatly impeded by the complexity and individuality of the studied subjects and their behaviour as well as the necessity for interpretation of the observed phenomena on the part of the researcher. Critics of quantitative methodologies claim that within social research, the general overemphasis on naturalistic measurements is unjustifiable, as reality, the ‘interpreted social action’, cannot be defined objectively (Robson, 2002, p. 23). Qualitative researchers suggest that since total objectivity is not achievable in a social context, it is indeed not necessary. In its stead, qualitative research aims to attain sensitivity, which means ‘having insight, being tuned in to, being able to pick up on relevant issues, events and happenings in data’ (Corbin & Strauss, 2008, p. 32). Instead of removing the researcher from the data collection process as much as possible, qualitative enquiry embraces the influence of the researcher, whose prior knowledge and experience of the studied field informs the research and lends depth to the data analysis. As qualitative enquiry does not place great emphasis on standardisation, it is more flexible in its approach and open to new developments in the research process (Flick, von Kardorff & Steinke, 2004, p. 5).

Qualitative research is often characterised by a rejection of the formulation of hypotheses prior to conducting the research, as this could force the enquiry too strictly into a certain, preconceived direction. Instead, the employed research

\textsuperscript{29} Hermeneutics: the study of the theory and practice of interpretation
designs are frequently of an emergent nature, allowing for the greatest possible openness to new findings (Meinefeld, 2004, p. 153; Creswell, 2007, p. 39). This same openness however also exposes qualitative research to criticism over validity, consistency, scholarly value and the overall quality of the approach and findings. Since quantitative criteria are not suited to evaluate a qualitative approach, Steinke (2004, pp. 185-187) calls for the development of independent quality criteria for qualitative research. At the heart of what she puts forward as the core criteria for every qualitative enquiry stands complete transparency – an exact documentation of all aspects of the research process, including the researcher’s prior knowledge and potential influence on the study, to allow public scrutiny of the research. Data interpretation in groups is also advised to help to minimise misinterpretation.

In historic terms, mixed methods studies are a relatively recent addition to the discourse of scientific methodology and particularly social science research (Bergmann, 2008, p. 1). Smith and Heshusius describe the historic opposition of the two main perspectives on social enquiry which prevailed for the better part of the 20th century. The quantitative tradition with its roots in realism advocated the existence of a social reality independent from the observers. In stark opposition to this, the idealist-influenced interpretive or hermeneutic tradition (which would nowadays be called qualitative orientation) ‘took the position that social reality was mind-dependent in the sense of mind constructed’ (1986, p. 5) and could therefore never be value-free. In the 1970s, Rist, a firm opponent of the then prevalent polarisation between qualitative and quantitative methods described a welcome rapprochement of the two research positions. The recognition of a ‘peaceful coexistence’, if not yet cooperation, for him constitutes a challenge to the ‘methodological provincialism reflected in the reification of the terms “qualitative methodology” and “quantitative methodology”’ (1977, p. 42). Rist however did not anticipate a convergence beyond said coexistence and mutual acceptance as he believed that in order for cooperation to develop, one side would have to abandon its rigid beliefs (p. 49). He certainly did not anticipate the speed at which mixed
methods approaches grew in popularity from the 1980s onwards (Smith & Heshusius, 1986; Bergmann, 2008).

Controversy arises over mixed methods research due to its attempts to combine not only different methods arising from fundamentally different theoretical backgrounds, but also different types of data. Brannen (2008, p. 63) writes about various considerations in the practice of mixed methods research and refers to Smith and Heshusius (1986) with a statement on the incompatibility of quantitative and qualitative data. While Smith and Heshusius indeed proclaim that ‘the call for cooperation between quantitative and qualitative inquiry cannot be sustained’ (1986, p. 4), it is worth noting that their paper was written and published at a time when mixed methods research was only just enjoying increased popularity. Further, their claim is mainly based on what according to them was a prevalent assumption that both quantitative and qualitative research methods could be applied to the same research questions and accomplish the same goals. This view has since been overhauled, as contemporary mixed methods researchers are acknowledging that the respective approaches may and indeed will only be suitable for answering certain types of questions, and that not all methods are applicable to all research approaches (Thomas, 2003, p. 7). Similar to the debate in qualitative research, there are however lingering concerns over the actual integration of data from qualitative and quantitative sources in a practical sense, as ways have to be found to compare differing data types without losing scientific accountability (Brannen, 2008, p. 56).

To believe that the field of mixed methods research has quietened since the 1980s would be misleading. Although the practice is enjoying ever greater popularity, it is this exact popularity that has some authors worried. Bryman (2008, p. 88), who declares himself a supporter of mixed methods approaches, points towards the dangers of running before one can walk. He fears that the explosive growth in the number of mixed methods studies in recent years has more often than not been the result of easy, "best of both worlds" justifications rather than
strict considerations of what approach best suits the research project. It has become somewhat fashionable to choose a mixed methods design, despite the fact that no general criteria have been laid down for what constitutes a good mixed methods study. According to Bryman, this is largely due to a lack of an ‘agreed-upon language for discussing mixed methods studies’ (2008, p. 88) and results in the inability to be prescriptive about mixed methods research design.

A further concern over the validity of mixed methods research is raised by the growing influence of constructionist and postmodernist thinking and their focus on the creation of social phenomena through interaction and social discourse. As a consequence of this theoretical background, the mere application of a certain research method must automatically influence the respective results. Therefore, we are ‘led to conclude that different methods construct the social world in divergent ways, so that combining them may not lead either to validation or to increasing the completeness of the picture’ (Hammersley, 2008, p. 28).

Despite the fact that the fundamental differences between quantitative and qualitative research methods should in theory render the combination of data sets from precisely these differing backgrounds impossible, Bergmann claims that mixed methods research has been employed successfully for a long time. It appears mixed methods designs work much better in practice than theorists would allow (Bergmann, 2008, p. 2). Indeed, Hammersley (2008, p. 31) laments the over-eager application of philosophical theories to practical research tools on the example of triangulation, stating that while the discussion of philosophical problems is valuable in its own right, it might not necessarily be relevant for the practice of social science research.

The author supports the application of mixed methods research under the condition that all research tools are chosen in accordance with their suitability to produce the correct results and all processes and data reported and evaluated

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30 Triangulation (social science): the use of multiple methods to determine the validity of a result
transparently. As this explorative investigation is in essence a qualitative study with quantitative elements, it is well suited for a mixed methods approach and a qualitative synthesis and analysis of all findings.

### 3.3 Applied Methods

This study aims at understanding the field of building conservation education as applied to undergraduate built environment degrees in the UK and build up a picture of the currents and influences that define and shape it. In many ways, this investigation is similar to market research prior to the conception, design and launch of a new product. For a product to be successful, it is imperative to understand the need or demand for said product, identify any potential competitors as well as investors and collaborators and understand the statutory requirements and/or industry standards the product must adhere to. This knowledge is the necessary basis for the development of a practical, feasible and useful product, such as the proposed Conservation Game as outlined in Chapter 6 (p. 178).

In order to gather the above relevant information, the study draws on as many sources as necessary, taking into account the various views of a number of key contributors to the built environment and heritage conservation (education) sectors. Looking at all potential aspects which influence the nature of building conservation education in built environment courses, one can group them into three main sectors: the general practice of built environment education in HE, given industry requirements and standards, and imposed statutory regulation. The industry requirements can be further subdivided into agents who accredit, commission and regulate built environment professionals on a day to day basis (RICS etc.), and agents who champion the protection of the historic built environment in general (English Heritage, Institute of Historic Building Conservation etc.).
This diagram however does not show the internal relationships between those three sectors and their respective influences on each other and on the building conservation education practice in built environment courses. An overview over this hierarchy of influences is displayed in Figure 15 (see below). The graphic focuses on how building conservation practice is informed in higher education, and does not represent an illustration of the general built environment sector.
Through cooperation in the sector and the publication and upholding of professional standards, representatives of both general built environment practice and architectural conservation create a code of conduct for work in the (historic) built environment, which inform the industry requirements for built environment professionals. The fact that these industry requirements are constantly under review is symbolised by the reciprocal influences of these three aspects in Figure 15. Built environment industry requirements together with statutory requirements for general higher education provide the guiding structure for the creation of built environment degrees in higher education. Building conservation education may or may not be a part of these degrees and its presence (or absence), symbolised by the translucent arrow, is more often than not a direct product of general built environment practices and standards rather than that of building conservation organisations (see also discussion of results in Chapter 5, p. 164).

In more detail, the areas investigated as part of this research include:

- The number and nature of applicable built environment courses
- Building conservation education as part of these courses
- Issues surrounding the practical implication of building conservation contents in built environment courses
- Industry support for teaching building conservation contents as part of built environment courses
- Industry opinions on the necessity of building conservation education as part of built environment courses
- The first-hand experience of teaching building conservation contents to students of applicable built environment courses
- Statutory requirements for HE degree programmes in the built environment sector
- Industry requirements for graduates of built environment programmes
As previously stated, the selected approach to primary data collection for this thesis is based on the exploration and study of multiple facets of the area where the built environment sector overlaps with building conservation and higher education, thus inviting a mixed-methods research approach. In order to ensure consistent results and maximise data compatibility, all employed research tools are based off each other or closely related, which also allows for better triangulation of results (Hammersley, 2008).

The starting point of this investigation was the necessity to determine a status quo of building conservation education, on a general level but more specifically as part of UK undergraduate built environment degrees as a baseline for further research and inference. Therefore, two course inventories were drawn up, encompassing all relevant building conservation courses on the one hand, and general built environment degrees on the other (for respective selection criteria see p. 103 and p. 108). These comprehensive registers allowed first deductions on the nature of building conservation education both within and outside of UK higher education.

The second research stage was both based on and necessitated by these inventories, as they build a first knowledge base while simultaneously demonstrating the limitations of even the most thorough scouring of public web-based information in regards to inconsistency, incompleteness and lack of depth. Therefore, to gain further insight into building conservation education practice, the inventory of built environment degree courses was employed as a basis for a survey. All course leaders of the established 144 applicable courses (see p. 118) were contacted as knowledgeable representatives of their respective degrees and invited to share their experiences of and attitudes towards building conservation education in HE and as part of their course to establish a comprehensive understanding of conservation education practices in built environment HE.

While the above first two steps in the investigation process supplied quantifiable data, both approaches were significantly limited in regards to the depth of information yielded and the discovery of the finer nuances and currents of and
within the research area. Therefore, a series of ten interviews with representative members of various groups within the built environment sector and higher education practice were conducted in order to gather qualitative information to flesh out and validate the inventory and survey data (see section 4.5). Interview participants were selected based on their professional background to be representing key professional bodies in built environment and conservation practice, built environment higher education and sector practitioners from across the south of the UK to gain as broad an understanding of building conservation practice and education (as applicable for general built environment practitioners) as possible (p. 154). Care was taken to also select participants whose professional background did not automatically predispose them favourably to the concept of building conservation in order to maintain a balanced approach and avoid bias.

The fourth aspect of the data collection process for this thesis involved the planning and delivery of the third year elective Residential Building Conservation, a semester unit for the BSc Property Management, Development and Design at the University of Portsmouth (section 4.4, p. 135). This teaching experience, while less related to the other three data collection tools than they are to each other, provided invaluable insights into the development and implementation of building conservation teaching and learning materials, the selection and preparation of content for novice learners and the application of case studies and interactive learning environments such as a role play. As such, many of the findings from this particular research tool informed the development of a model curriculum for novice conservation learners as presented in section 6.2.3 (p. 210).

Despite individually investigating slightly differentiated areas, all aspects of the research are aligned along four main criteria within the research objective: they all investigate, in varying depth according to the respective area and method, the necessity, practicality, feasibility and reality of and for the application of building conservation education in built environment programmes in relation to the proposition of a Conservation Game.
Necessity

This criterion focuses on the demand aspect of building conservation education. It looks, among other things, at the involvement of built environment professionals in Building Conservation projects, the impact of building conservation on the property market and the attribution of value to BC within the built environment industry.

Practicality

This aspect covers the practical aspects of adapting building conservation contents for undergraduate built environment programmes and their actual implementation. It investigates the influence of resources (material and knowledge-based), or lack thereof, on the building conservation education practice and studies the availability and effect of external encouragement/support (EH, RICS, etc.).

Feasibility

Here, the benefits of building conservation education or awareness training for aspiring built environment professionals is under scrutiny. This criterion looks at whether and how the acquisition of building conservation skills is more relevant to certain professions within the built environment sector than others, and investigates the probability of institutions supporting the Conservation Game.

Reality

As suggested by the title, the actual practice of building conservation education is studied as well. This includes investigating the extent to which this topic is taught in built environment programmes, the nature of common teaching environments, the level of subject detail presented to the students and the nature of the content focus (i.e. practical or philosophical).

The above categories serve as general guidelines for the procurement and evaluation of data in Chapter 4. They are formulated flexibly in order to allow for new findings and developments during the research process yet are, whether
explicitly stated or not, applied to every aspect of the data collection and evaluation process to provide a modicum of continuity and comparability throughout this mixed methods research.

### 3.3.1 RESEARCHER’S BACKGROUND STATEMENT

As implied by the focus of this thesis, the researcher and author has both an academic background as well as a strong interest in the protection and management of the historic built environment. As such, the author is naturally in favour of an increase in building conservation awareness training, particularly as part of built environment courses in HE. Care has to be taken that objectivity be maintained as much as possible and that said partiality does not result in favouritism of some data sets over others. While qualitative inquiry demands the researcher to be engaged with the subject matter and immersed in relevant discourse, it requires at the same time, and specifically due to this immersion, a strong measure of (self-) control to achieve the necessary levels of detachment. As such, qualitative inquiry and analysis is always a balancing act and requires a maximum of transparency (Steinke, 2004, p.187).

Having completed an MSc in Historic Building Conservation prior to embarking on this research, the author has a comprehensive understanding of the philosophical background and necessity for the implementation of building conservation, but lacks practical experience in the industry - a restriction which must be taken into consideration when making generalisations about industry practices. Due to having graduated with a BA in Interior Design, the author is further equipped with a grounded appreciation of contemporary design concepts and their implementation in existing fabric. This combination leads to a profound eagerness to integrate the old with the new, and vice versa, which at times makes for propositions offensive to traditionalists. Previous research for example included the study of representations of historic architecture in contemporary entertainment media such as television, film and video games (Aygen & Hauer, 2012).
Furthermore, the author’s leisure time involvement in online (multiplayer) games elicits a particular interest in the potential of harnessing digital games for educational purposes. As such, the author harbours an inherent appreciation of games as tools for both entertainment and education and a belief in the motivational and influential powers of games and the validity of their employment in (higher) education. The author thus may exhibit a certain bias towards the implementation of game-based learning over more traditional education approaches - however, since this precise fascination has led to the research presented in this thesis, the term bias may not be seen in an entirely negative light in this context. Nevertheless, the author is aware of personal backgrounds and preferences and strives to eliminate them from the procurement and evaluation of data wherever possible and/or feasible.
4 - DATA COLLECTION - Research Tools

4.1 Introduction and Overview

The following chapter outlines the different approaches taken to this multi-disciplinary mixed-methods research project. Sections 4.2, 4.3 and 4.5 describe the central three-step strategy for primary data collection to establish the nature and extent of building conservation education for the built environment sector in accordance with the four criteria (necessity, practicality, feasibility, reality) laid out in Chapter 3 (p. 94). This three-step programme combines the largely quantitative approaches of a course inventory and course leader survey with the qualitative aspects of an interview series to illustrate the different dimensions of the complex field of building conservation education in as much breadth and detail as possible. Section 4.4 is principally separate from the core data collection but supplements the study in illustrating a practical approach to teaching strategies for building conservation education as part of general built environment courses. Section 4.4 is presented prior to the interview section as some of the related findings and experiences directly informed the interview stage.

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Each sub-chapter describes the methods used, preparation and sampling processes (if applicable), the data collection process and gathered results and offers a short analysis of the data obtained through the respective method. A full synthesis and detailed discussion of all results including the findings from literature review and secondary resources are presented in Chapter 5 (p. 164)
4.2 Course Inventories

As the perusal of relevant literature suggested that building conservation (and heritage) education in the UK currently concentrates around basic awareness-building in children on the one hand and highly targeted specialist training for professionals on the other, it seemed necessary to investigate the middle ground, particularly since this middle ground constitutes the playing field for most built environment professionals in practice. The investigation into the provision of conservation education is split into two sections. In order to provide the backdrop for investigations into HE practices, the first part looks at the scope and nature of specialist conservation training courses. These specialist offers include some HE programmes but also cater for practitioners and craftspeople through Continued Professional Development (CPD) courses and conservation-relevant crafts training. The second part of this investigation aims at drawing up an inventory of built environment degree courses without conservation specialisation currently on offer in UK higher education.

4.2.2 SPECIALIST CONSERVATION COURSES

Although this project is not concerned with specialist conservation training per se but rather aims at a more general understanding, it nevertheless seems prudent to briefly investigate the expertise side of conservation education as well. By exploring the range of specialist course types and subject areas on offer, one may make deductions as to the general set-up of the built environment industry, and here particularly that of the building conservation sector.

Sampling

If one is looking for a UK-based building conservation course on the internet, the Building Conservation Directory is currently one of the most prominent and comprehensive databases. Aimed mostly at practitioners, it offers a variety of course types of differing length and a range of conservation-relevant subjects.

31 The Building Conservation Directory: [www.buildingconservation.com](http://www.buildingconservation.com)
Although institutions have to approach the Directory to be listed there, which means that no guarantees to exclusivity can be made, this tool was chosen for this particular part of the research due to its accessibility and representative array of listed courses.

The courses are structured roughly into four key course types:

- **Short courses**: CPD (Continued Professional Development) options varying in length from several hours to several days
- **Undergraduate courses**: University-level, degrees and HE certificates; also includes foundation courses
- **Postgraduate courses**: University-level, masters degrees and postgraduate diplomas; also includes post-qualification courses
- **Craft training**: variety of conservation-specific craft courses, variety of vocational qualifications (longer-term training than CPD)

The offers in each of these categories were compiled into a list and evaluated in terms of course subjects. Despite the courses leading to a multitude of different qualifications (academically, practice-relevant and craft-relevant), all courses and subjects were treated as equal for the purpose of this study in order to give an overview over the subjects on offer. Four main subject groups could be differentiated:

- **Building conservation – general**: topics and trainings relating to building conservation as a whole (theoretic)
- **Building conservation – specific**: courses addressing a highly specific aspect of building conservation (for example lead conservation or lime mortars) (theoretic)
- **Craft skills**: subject-specific training for craftspeople (practical)
- **History/Heritage subjects**: broader and more general than building conservation (theoretic)
Inventory Results

The representatives of each course type as well as each topic area across course types were counted and compiled into a table (see Figure 16).

Subject distribution over course types

Figure 16: Subject distribution over course type (specialist building conservation courses)

Figure 16 graphically illustrates several aspects of specialist building conservation education as practiced in the UK in 2011/12. In terms of the number of courses on offer, the short course category (CPD) is the largest, followed by postgraduate training and craft training. This signifies that building conservation training is largely focused on practicing professionals, both on the management as well as crafts side, including postgraduate and post-qualification courses. Only 9% (15 in total) of all courses are aimed at undergraduate students, and only three out of 42 craft training courses are labelled as apprenticeships.
The bulk of course subjects on offer (51%) concentrate on craft skills in some form – this is illustrated by Figure 17. Not only is the craft courses category a large entity in itself, craft training also makes up the lion’s share of short courses (almost 61% - Figure 16). Naturally, crafts are not a large focal point in HE settings, which focus more on an academic route to (general and specific) conservation.

**Figure 17: Subject distribution (specialist building conservation courses)**

General conservation topics make up the second-largest share of subjects (27%), and constitute the largest subject groups in undergraduate and postgraduate courses.

History and heritage subjects come up occasionally as part of a wider conservation context, but their relatively low number should not convince the reader of the insignificance of this particular strand of study. It is rather that history and heritage management courses are usually, but perhaps surprisingly, operated separately from conservation courses, and do thus not show up in the conservation directory register. They are also only indirectly relevant to this study.

**Evaluation and Implications**

Professional training, and here again especially short courses, make up the largest group of courses on offer, which allows the reasonable deduction that such courses are most in demand. Be it on the academic/managerial side or the side of the craftsman, these courses offer the professional a short, often very targeted
glimpse at a specific aspect of building conservation without, one may perhaps say, encumbering the professional too much with lengthy talks and general subjects. This of course makes sense for the professionals who need to find time to attend CPD courses. However, if one considers that conservation-relevant craft skills training is by definition specialised, general (basic) conservation training only makes up less than a quarter (27.1%) of all taught subjects on the register. In combination with the almost negligible number of undergraduate courses on offer, this paints the picture of a group of specialised practitioners catering for other specialised practitioners, where particularly the educational transition from general built environment graduate to conservation-savvy practitioner seems undervalued, especially if one does not want to commit to a full postgraduate qualification. The findings also show a dominant emphasis on craft training, confirming the indications given in the literature.

These findings did not bring about the question of how building conservation education is being practiced as part of undergraduate built environment degrees, as this question had already been formed. However, they underline its relevance to overall building conservation practice. The following section presents the first step towards illustrating these same practices in drawing up an inventory of built environment degrees.

4.2.3 BUILT ENVIRONMENT DEGREES in UK HE

In order to provide a basis for investigation into the practice of building conservation education as part of UK built environment courses on undergraduate level, a second course inventory was drawn up. This second inventory focussed on the range of available built environment degrees across the United Kingdom with the aim to provide data about the nature of the course and professional accreditations to build a communication and selection basis for the course leader survey discussed in section 4.2.4. The inventory also looks at the online advertisement of building conservation contents within course structures. Previous conversations with conservation and property experts at the University of
Portsmouth had suggested that scattered building conservation units were included in property syllabi at various institutions, yet the full extent of this practice was unknown.

**Sampling**

In order to draw up a comprehensive list of built environment undergraduate courses on offer in the UK, the online search platform [www.ukcoursefinder.com](http://www.ukcoursefinder.com) was employed in the initial selection process. The tool features close links to the British Universities and Colleges Admissions Service (UCAS) and claims to cover almost all of the more than 50,000 various courses and degrees in the country ([http://www.ukcoursefinder.com/help.aspx?theme=3](http://www.ukcoursefinder.com/help.aspx?theme=3)).

The initial course selection in May 2010 searched for courses related to the keyword “Property” across all regions, subjects and institutions, but specified degree courses as the only relevant course type. The resulting preliminary selection included 290 degrees offered by 53 institutions and contained a broad spectrum of property-related core course foci including financing, architectural technology, design and business. This preliminary selection was narrowed down to only include such courses as focus on the appraisal, development and management of the (urban/residential) built environment. Any course formats other than full-time honours programmes, as well as degrees with strong finance, technical (structural), architectural or design foci, were excluded (this initially included planning programmes – see p. 111). These selection criteria were chosen in order to encompass degrees which all educate prospective professionals to actively shape the built environment but are essentially in structure what could be called “classroom” degrees – predominantly taught in lecture format. In contrast to that, design disciplines heavily feature studio practice to teach reflection-in-action and design-related problem-solving. The course selection builds the basis of operation for the thesis proposal (see Chapter 6), so while the Conservation Game has the potential to be relevant to design disciplines within the built environment as well, it was decided that the introduction of basic conservation and regeneration skills and
awareness, which rely heavily on project-individual problem solving, was more essential, at least for the short term.

The presence of a professional course accreditation (RICS, CIOB, etc.) was of no relevance in the selection criteria. All results from ukcoursefinder.com were cross-checked against information on the official websites of the respective institutions to avoid out-of-date data, and amends made to the list where necessary. Precedence was given to the institution’s data over ukcoursefinder.com. The resulting, streamlined list featured 145 applicable course programmes at 42 institutions across the UK. In May 2011, this list was updated again as several programmes had been discontinued, while new relevant programmes had been added to the course catalogue. The final inventory includes 144 undergraduate programmes from 42 institutions.

The selection of 144 programmes constitutes a purposive sample, suitable for the needs of this particular research. Since the aim of this research is not to establish probabilities from a random, representative sample of the overall population, this non-probability approach was chosen in order to focus on a very specific type of educational format and topic area (Robson, 1993, p. 141). The specific project target group (UK undergraduate built environment degrees) allows for very specific, targeted sampling, which leads to a clearer area focus.

Inventory

All sampled courses were compiled into a list together with course data obtained from the official institutions’ websites in a cursory investigation aimed at mapping out the study area. The data gathered in this first, outlining investigation included organisational data such as UCAS codes, length of course, entry requirements and course accreditations by professional bodies, as well as a precursory look into course structures to reveal any obvious building conservation emphases. All of the data discussed in this section is openly available online.

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32 UCAS: Universities and Colleges Admission Service (UK) (see glossary)
An initial evaluation of the list revealed a copious amount of course titles and respective variations between different institutions. While this complicates classification, it is not ultimately detrimental to the nature of the study, since all applicable degrees are treated equally. The various courses can be structured into the following main groups (for a full list see spreadsheets in Appendix B):

- Property Management and/or Marketing
- Property Development
- Building Surveying
- Quantity Surveying
- Construction (Project) Management
- Real Estate (Management)
- Planning
- Built Environment and/or Building Studies
- Sustainable Development

Over the 144 investigated courses, these subject areas are distributed as follows:

![Figure 18: Subject distribution across eligible built environment degrees in the UK](image_url)

**Figure 18**: Subject distribution across eligible built environment degrees in the UK
As shown in Figure 18, Construction Management, Quantity Surveying and Building Surveying are the most prominent subjects in built environment education in the UK. It is reasonably to suggest that the provision of courses mirrors a demand from the built environment industry, which in turn suggests an industry emphasis on new builds, costing aspects and the evaluation of existing buildings, followed by the management of existing structures and their (re)development.

The additional eleven Planning courses shown in Figure 18 were not part of the original 144 courses in the inventory due to their affiliation with architecture and design disciplines, but have been added in retrospect as a point of interest in response to suggestions made in the interview series (p. 155). Unless specifically stated, these 11 planning courses are not represented in the following analysis of the inventory.

Results & Discussion

Apart from six distance-learning courses, all programmes in the inventory are honours degrees, with 97% of all courses (139) culminating in a Bachelor of Science (BSc). The retrospectively added eleven planning courses differ from this in so far as nine out of eleven (82%) finish with a Bachelor of Arts (BA), illustrating their previously mentioned affiliation with arts and architectural design. The majority of courses are run as a three year programme, but many institutions offer an optional fourth year in the form of a professional placement; at some institutions, this placement year is compulsory or strongly recommended.

UCAS POINTS, SUBJECTS & PROFESSIONAL ACCREDITATION

The inventory also collected data on course intake standards (UCAS points) and professional accreditation of courses. Approximately two thirds (69%) of the built environment courses recorded in the inventory are accredited by a professional body. Table 1 lists the most common professional accreditations and their frequency of occurrence.
The total number of accreditations surpasses the total number of accredited courses as some programmes are recognised by multiple bodies. Between themselves, the Royal Institution of Chartered Surveyors (RICS) and the Chartered Institute of Building (CIOB) account for the bulk of accreditations in the built environment sector.

In terms of course intake standards, the inventory suggests that while Higher Education Institutions (HEIs) cater for students of all abilities in built environment subjects, there is a tendency towards medium- to high-requirement courses (Figure 19).

### Table 1: Professional accreditations of eligible built environment programmes in the UK

<table>
<thead>
<tr>
<th>Accreditation</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional accreditation</td>
<td>144</td>
<td>100%</td>
</tr>
<tr>
<td>RICS (Royal Institution of Chartered Surveyors)</td>
<td>62</td>
<td>43.06%</td>
</tr>
<tr>
<td>CIOB (Chartered Institute of Building)</td>
<td>46</td>
<td>31.94%</td>
</tr>
<tr>
<td>ABE (Association of Building Engineers)</td>
<td>7</td>
<td>4.86%</td>
</tr>
<tr>
<td>RTPI (Royal Town Planning Institute)</td>
<td>3</td>
<td>2.08%</td>
</tr>
<tr>
<td>No accreditation</td>
<td>45</td>
<td>31.25%</td>
</tr>
</tbody>
</table>

![UCAS intake points and frequency](image_url)

**Figure 19:** UCAS intake points and frequency of occurrence across eligible built environment programmes
The minimum entry requirement found is 120 UCAS points, whereas the highest requirement is 340. No course with an entry requirement lower than 230 points was found to be accredited by RICS; 230 points incidentally also represents the precise middle of the range of points found in built environment courses, and is thus treated as a threshold within the confines of this project (see Table 2). 60% of all accredited courses in this investigation (59 out of 99) lie on or above this threshold in terms of their entry requirements.

Table 2: UCAS intake points by Subject

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject area name</th>
<th>No.</th>
<th>% of total</th>
<th>% of &lt;230</th>
<th>% of no. over 230</th>
<th>UCAS min</th>
<th>UCAS max</th>
<th>range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Property (Development)</td>
<td>13</td>
<td>9.0%</td>
<td>3</td>
<td>23.1%</td>
<td>180</td>
<td>300</td>
<td>120</td>
</tr>
<tr>
<td>B</td>
<td>Building Surveying</td>
<td>25</td>
<td>17.4%</td>
<td>2</td>
<td>8.0%</td>
<td>180</td>
<td>300</td>
<td>120</td>
</tr>
<tr>
<td>C</td>
<td>Quantity Surveying</td>
<td>29</td>
<td>20.1%</td>
<td>4</td>
<td>13.8%</td>
<td>160</td>
<td>320</td>
<td>160</td>
</tr>
<tr>
<td>D</td>
<td>Construction Management</td>
<td>34</td>
<td>23.6%</td>
<td>16</td>
<td>47.1%</td>
<td>120</td>
<td>300</td>
<td>180</td>
</tr>
<tr>
<td>E</td>
<td>Real Estate (Management)</td>
<td>20</td>
<td>13.9%</td>
<td>6</td>
<td>30.0%</td>
<td>180</td>
<td>340</td>
<td>160</td>
</tr>
<tr>
<td>F</td>
<td>Property (Management/Marketing)</td>
<td>12</td>
<td>8.3%</td>
<td>5</td>
<td>41.7%</td>
<td>160</td>
<td>300</td>
<td>140</td>
</tr>
<tr>
<td>G</td>
<td>Planning</td>
<td>4</td>
<td>2.8%</td>
<td>0</td>
<td>0.0%</td>
<td>280</td>
<td>300</td>
<td>20</td>
</tr>
<tr>
<td>H</td>
<td>Built Environment/Building Studies</td>
<td>5</td>
<td>3.5%</td>
<td>3</td>
<td>60.0%</td>
<td>150</td>
<td>240</td>
<td>90</td>
</tr>
<tr>
<td>I</td>
<td>Sustainable Development</td>
<td>2</td>
<td>1.4%</td>
<td>1</td>
<td>50.0%</td>
<td>200</td>
<td>260</td>
<td>60</td>
</tr>
<tr>
<td>total</td>
<td></td>
<td>144</td>
<td></td>
<td>40</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 lists the minimum and maximum UCAS intake points for each of the subject areas defined on page 110. The retrospectively added 11 planning degrees are listed as auxiliary.

Table 2 also presents how many of the degrees within each subject area lie beneath the above outlined threshold of 230 UCAS points. The largest represented subject (D – Construction Management), also shows the largest range of intake requirements, ranging from 120 up to 300 points. Of the 34 degrees in subject D, almost half (47.1%) lie below the 230 point threshold, suggesting that this subject area caters for students of all abilities equally well. In contrast, the second-largest subject (C – Quantity Surveying) shows a similar overall range of requirements but of all courses in this category, only 13.8% lie below the threshold, suggesting a
tendency towards higher-entry requirements within this subject area. The density spread of UCAS intake points by subject area is illustrated in Figure 20 (p. 114) and Figure 21 p. (115).

In Figure 20, the intake points for most subject areas are shown to aggregate around a mean of 250, with the flat, wide curve of subject D (Construction Management) demonstrating the wide range of the respective intake spectrum and its homogenous distribution across the majority of the range. The leftmost curve (indicating the lowest average intake requirements) represents subject H (Built Environment/Building Studies), which is a group of degrees dealing with the built environment on very general terms without specific focus on professional specialisation.

The most striking aspect of Figure 20 is the density spike for subject G, which represents Planning. This in comparison to the other curves unnatural spike was attributed to the limited data sample for Planning courses (4) in the original inventory. Figure 21 (following page) depicts a similar histogram under
consideration of the 11 Planning degrees added to the inventory in retrospective, enlarging the sample. While still indicating a tendency towards particularly high entry requirements, the curve for Subject G (Planning) is more in keeping with the overall results. The high entry requirements for Planning degrees can be attributed to the particular complexity of the multidisciplinary subject area.

The study also looked into a possible statistical correlation between entry requirements and professional accreditation in courses. A Kruskal-Wallis test performed on the entry requirements against the presence of a professional accreditation showed that the correlation is statistically significant (P = 0.026).

Figure 22 illustrates the distribution of courses’ entry points divided into two groups (“accreditation” [black] and “no accreditation” [red]) and graphically demonstrates the higher density of high-requirement courses for the “accredited”

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33 The Kruskal-Wallis test is the non-parametric equivalent of an Analysis of Variance (ANOVA) test and was employed due to the sample not being normally distributed
group. In other words, accredited courses are statistically more likely to have higher entry requirements than courses without accreditation.

Histogram of UCAS intake points against Professional Accreditation

![Histogram of UCAS intake points against Professional Accreditation](image)

Figure 22: Histogram of UCAS intake points against Professional Accreditation

BUILDING CONSERVATION CONTENTS

As expected, a widespread inaccessibility of detailed course structures on the respective HEI’s websites proved a complication in uncovering elements of building conservation education as part of the selected courses. Where some HEIs provide relatively detailed insights into course structures, contents and delivered units, others content themselves with a vague description of the main areas of study interest. This investigation revealed that of the 144 courses on the inventory, 24 (16.7%; at 13 institutions) contain one or more units or options with a focus on building conservation, examples of which include rehabilitation studies, refurbishment, conservation and adaptation, depending on the respective institution’s preferences.
Seven of the 42 institutions recorded in the inventory offer a specialist building conservation course (undergraduate or postgraduate), signalling the availability of conservation (education) expertise at the respective institution. However, the presence of conservation expertise at an institution does not seem to influence the presence of conservation contents in built environment courses at that institution, as only one in five programmes which openly advertise conservation contents are offered by an institution with conservation expertise. However, of the 13 institutions offering courses with conservation-specific units, those with a large built environment department or school (as judged by the number of courses on offer [five or more]) seem more likely to include building conservation aspects in more than one course than those with smaller built environment departments (see spreadsheet, Appendix B).

The author’s suspicion that professional accreditation may make a course more likely to include historic building conservation (HBC) contents was not confirmed. The percentage of accreditations in relation to the number of courses with building conservation content (16 of 24 – 66.7%) is almost identical to the percentage of professionally accredited courses in relation to the total amount of courses (99 of 144 – 68.8%). In other words, the amount of accreditations among courses with HBC contents is representative of the overall percentage of total accredited courses, suggesting that the presence of accreditation is not likely to directly support the presence of HBC contents. Indeed, discussion of the results in sections 4.3.3 (p. 129) and Chapter 5 (p. 176) suggest that the opposite may be the case.

LIMITATIONS

Although this data serves to give an overview over the built environment side of UK HE, it is difficult to make generalisations from this inventory. As it is based on course information openly provided by the HEIs on their respective websites, it is non-uniform and subject to frequent change. Particularly in terms of establishing the extent of building conservation education, it can only serve as an indicator. It is believed that if a course does offer building conservation education as a dedicated
element within the course structure, the online representation of that course structure will make reference to it. However, this is an assumption and the results of this inventory can thus not be taken as absolutes. It has to be assumed that conservation contents are more commonly discussed as part of non conservation-specific modules and/or lectures. This outlines the necessity for a further, deeper investigation into conservation education practices, as described in sections 4.3 and 4.5 (p. 118 and 149).

4.3 Course Leader Survey

The evaluation of the inventory of applicable built environment degrees and conversations with lecturers in the School of Civil Engineering and Surveying at the University of Portsmouth fostered the belief that conservation contents, albeit rarely packaged as a full unit (as mentioned above), are nevertheless likely to be discussed sporadically in the course of non conservation-specific modules and/or lectures. In order to gauge the extent to which building conservation and/or regeneration issues are being discussed with students both as part and outside of dedicated conservation units, a concise questionnaire was put to the course leaders of the 144 undergraduate built environment degrees represented in the inventory (Appendix C).

4.3.1 PREPARATION AND SAMPLING

Course leaders were chosen as questionnaire participants due to their close involvement with the development and delivery of their respective course, both on academic as well as administrative levels, and their prominent position within departmental structures which facilitates contact.

Realising the considerable work pressure on above course leaders in general, the survey was designed to be short and concise with a maximum completion time of five minutes. Online distribution was chosen to facilitate responding. The questionnaire consists of five questions on:
The extent to which building conservation contents are being discussed both as part and outside of dedicated conservation units on the selected built environment degrees over the duration of the degree

The nature of building conservation contents discussed as part and outside of dedicated conservation units

The mode of teaching of above building conservation contents

The feasibility and practicality of including building conservation contents into non-conservation specialist built environment degrees

For the full questionnaire, please see Appendix C.

**Pilot**

For pilot testing, the survey was sent to ten lecturers at the University of Portsmouth, all of whom were in one way or another experienced in teaching on various undergraduate built environment courses, including actual course leaders as well as full- and part-time staff both with and without building conservation expertise. The target group selection focussed on a mix of people with diverse backgrounds (both culturally and professionally), aiming at ruling out as many ambiguities as possible in terms of understanding and answerability of the questions.

The survey was hosted by the online platform surveygizmo.com, which was intended for use in the actual data collection process in order to test for and prepare against potential technical and distribution issues. During the pilot, the regular survey questions were supplemented by additional text boxes for immediate feedback in order to avoid lengthy email conversations and shorten response times.
Pilot results and changes to questionnaire

The pilot testing revealed some inconsistencies in the questionnaire design, as well as bringing to light obscurities thrown up by the terminology used. Respondents also stressed the wish for the survey to be as concise as possible. Suggestions were taken into consideration and changes made accordingly.

Despite working on a research project at the same university, and knowing many of the pilot group personally, the response rate was surprisingly low. The effects of the various severity measures imposed as a result of the economic crisis following the year 2008 can be felt partly in that lecturers are now required to take responsibility for more than their regular work load and are consequently being kept very busy. One can sensibly assume that this is the case across most institutions.

4.3.2 SURVEY DISTRIBUTION

In preparation for the survey distribution, the websites of the institutions chosen in the inventory were revisited to establish a main contact (course leader) for each of the applicable courses, while at the same time validating the accuracy of the data from the previous year (as described on pages 109 and following).

The search for contact details online was considerably hampered by a varied, at times non-transparent nomenclature of the role of a course leader (also called course director, programme leader, programme director and at times pathway leader). Further, against expectations the more administrative roles of academic members of staff are in many cases not clearly signposted on the institutions’ websites, complicating the identification of course leaders. The quality as well as quantity of the publicly disclosed information is frequently inconsistent not only between institutions, but also between different faculties or departments within a given institution. Apart from constituting a practical hurdle to this research, this also underlines prevailing inconsistencies in education communication as a result of institutional independence. Where the necessary contact information could not be
acquired online, contact details for the selected course leaders were requested directly from the respective institutions.

In April 2011, the survey was launched online through the survey tool www.surveygizmo.com and a direct link to the survey sent out to the mailing list of course leader contacts. No pre-notification messages had been sent, as it was assumed that the contacted members of staff would either set to completing the questionnaire immediately, or postpone and subsequently forget about it or else ignoring it outright – for this reason, the email also did not contain a set deadline by which the data should be returned. It was assumed that follow-up messages would be necessary in most cases and the amount of emails sent to an individual contact was aimed to be as contained as possible so as to not cause irritation. Tabs were kept on who of the contacts had responded to the questionnaire, and care was taken to omit those from the follow-up mail-out.

The distribution phase experienced problems caused by a surprising number of invalid email addresses either provided online or directly by institutions; where possible, these were followed up to establish valid contacts. Despite the follow-up, 29 emails were returned from invalid addresses (20.1% of 144 sent). This left 115 valid contacts for the survey.

A number of automated out of office messages (11) led to the realisation that although the academic year was still running, some members of staff had already gone on annual leave and would not be back until the Autumn. Although the date of distribution was chosen so it would not interfere with any academic holidays and would find most contacts in their offices, a higher response rate might have been achieved by distributing the questionnaire earlier in the year.
4.3.3 RESULTS

RESPONSE RATE

Of the 115 valid contacts invited to participate, 53 responded to the survey. Of these, 19 were recorded as incomplete responses which could not be taken into consideration in the data analysis, leaving a total of 34 valid responses from 19 different institutions. This constitutes a response rate of 29.6% after the initial survey mail-out and two follow-up rounds.

Although the response rate of any given survey study is generally considered an important factor in determining the quality of said study, there are no agreed norms as to what constitutes a good, acceptable or reasonable response rate (Baruch, 1999, p. 422). Low response rates increase the risk of statistical bias (Tomaskovic-Devey et al., 1994), yet a consensus on how much non-response is too much has not been reached (Rogelberg & Stanton, 2007). Baruch and Holtom, having analysed 1607 studies featuring mail surveys, report an average response rate of 52.7% for data collected from individuals, and 35.7% for data collected from organisations (2008, p. 1139). Baruch and Holtom’s results are supported by Henderson (1990) and Denison and Mishra (1995) in suggesting that high-ranking representatives of organisations are significantly less likely to respond to surveys than the general population. While academic course leaders do not entirely fit the profile of top executives, they nevertheless hold positions of respect and leadership within Higher Education Institutions (HEIs) and are subject to both a high workload and a potential institutional policy of academic information non-disclosure. While a greater number of valid responses would have increased the fidelity of the data, a response rate of just under 30% can be considered reasonable in this light.

A look at the responses to the actual questions (in particular Question 1, see p. 126) throws a different light on the response rate and the (potential) nature of non-responders. Question 1 addresses the amount of tuition time spent on building conservation contents over the course of a degree. Apart from two, all respondents report the coverage of building conservation contents to some extent as part of
their respective degree, and 19 out of 34 (55.9%) report the presence of at least one dedicated building conservation unit (see Table 3). Compared to the 16.7% across all courses established in the inventory (see p. 116), this indicates a particular interest for building conservation on the part of the actual survey respondents. It also indicates a consequent slight bias of the actual responses towards the acceptance of building conservation contents in built environment degrees. It could thus be argued that course leaders whose course features building conservation more or less prominently are more likely to respond to a survey on building conservation contents in built environment degrees. However, this notion cannot be scientifically proven given the data available.

While there is conflicting evidence whether or not the pre-notification of participants increases actual response rates (Sheehan, 2001), it may have been beneficial to the response rate of this survey to notify participants ahead of the actual questionnaire distribution.

**NATURE OF RESPONDENTS**

At the beginning of the questionnaire, participants were asked to identify their respective HEI and the course(s) they were responsible for at the time. This information allowed the cross-referencing of the survey results with the data gathered in the inventory. Table 3 (p. 124) illustrates the 34 responses in relation to their subject categories, UCAS intake requirements, professional accreditation and the evidence of building conservation content after the completion of the inventory. It also includes the course leaders’ report of one or more conservation units in their degree structure as established from Question 1 (p. 126). Due to considerations concerning the preservation of the respondents’ anonymity, the actual course names are not identified here. In the UCAS points column, the highlighted fields indicate intake requirements over the 230 points threshold identified on p. 113.
<table>
<thead>
<tr>
<th>response code</th>
<th>subject category</th>
<th>min. intake requirement</th>
<th>Professional Accreditation</th>
<th>course offers HBC contents (inventory)</th>
<th>institution offers HBC courses</th>
<th>Course offers conservation unit(s) (survey)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>280</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>2</td>
<td>D</td>
<td>270</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>3</td>
<td>B</td>
<td>260</td>
<td></td>
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<td>x</td>
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<td>x</td>
</tr>
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<td>230</td>
<td>x</td>
<td>x</td>
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<td>7</td>
<td>D</td>
<td>160</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>A</td>
<td>280</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>D</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>32</td>
<td>C</td>
<td>240</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>D</td>
<td>220</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>34</td>
<td>D</td>
<td>180</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>26 (&gt;230)</td>
<td>28</td>
<td>9</td>
<td></td>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

Table 3: Survey responses against main categories of course inventory

Table 3 shows the 34 responses to be from a wide range of subject areas (discussed in more detail below; see Table 4). 28 respondents (82.4%) lead professionally accredited courses, and of the 34 responses, 26 (76.5%) lie above the
230 UCAS points threshold. Of those courses listed in Table 3, nine were found to show evidence of building conservation aspects within their course structure during the inventory stage. In the survey stage, all but one (course 31) of these courses were confirmed to feature one or more units dedicated to building conservation issues, and a further 11 were discovered. Of all responding courses, 56% (19 of 34) claim to feature building conservation units; as stated in the section discussing the response rate, this finding was surprising and will be discussed further on page 133.

Further, the two rightmost columns in Table 3 show that the presence of a specialist building conservation degree at a specific university, i.e. the presence of conservation expertise on among members of staff, does not necessarily impact on the presence of dedicated building conservation units in built environment degrees at the same institution. This finding will also be discussed in relation to Question 5 on page 131.

<table>
<thead>
<tr>
<th>Subject code</th>
<th>Subject area name</th>
<th>No. of responses</th>
<th>% of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Property (Development)</td>
<td>3</td>
<td>9%</td>
</tr>
<tr>
<td>B</td>
<td>Building Surveying</td>
<td>11</td>
<td>32%</td>
</tr>
<tr>
<td>C</td>
<td>Quantity Surveying</td>
<td>5</td>
<td>15%</td>
</tr>
<tr>
<td>D</td>
<td>Construction Management</td>
<td>7</td>
<td>21%</td>
</tr>
<tr>
<td>E</td>
<td>Real Estate (Management)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>F</td>
<td>Property (Management/Marketing)</td>
<td>5</td>
<td>15%</td>
</tr>
<tr>
<td>G</td>
<td>Planning</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>H</td>
<td>Built Environment/Building Studies</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>I</td>
<td>Sustainable Development</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 4: Responses by subject area

Table 4 lists the survey responses by subject category. A majority of responses (23) represent the three largest subject groups identified in Table 2 (p. 113) and Figure 18 (p. 110) – Construction Management, Quantity Surveying and Building Surveying. However, in contrast to the inventory, the largest subject group within the survey responses is subject B, Building Surveying (32% of responses). Nine of the 19 courses reporting building conservation units (47%) are
found in subject group B, giving the overall impression that Building Surveying is the most likely subject area within the spectrum of evaluation, development and management-based built environment degrees to include building conservation units into its curricula.

**Question One – Tuition time spent on conservation aspects**

Question 1 addressed the approximate amount of total teaching time dedicated to building conservation contents and issues over the course of a degree (for exact wording and full questionnaire, please see appendix C). The selection of answer choices ranged from sporadic reference to building conservation issues to dedicated lectures, seminars and/or units. Participants were able to select multiple answers if applicable, thus the overall number of responses to items within Question 1 (as indeed all five questions) exceeds the overall number of survey responses. The maximum number of responses per question item is 34.

**Qu.1: Responses to overall tuition time dedicated to building conservation contents**

<table>
<thead>
<tr>
<th></th>
<th>No. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>2</td>
</tr>
<tr>
<td>one or more unit(s)</td>
<td>19</td>
</tr>
<tr>
<td>project/ seminar</td>
<td>3</td>
</tr>
<tr>
<td>several sessions</td>
<td>6</td>
</tr>
<tr>
<td>one session</td>
<td>2</td>
</tr>
<tr>
<td>sporadic reference</td>
<td>12</td>
</tr>
</tbody>
</table>

Figure 23: Survey Question 1 results

As Figure 23 shows, only two respondents reported their courses to contain no reference to building conservation contents at all over the duration of the degree. Most remarkably, 19 out of 34 respondents (56%) reported the presence of at least one dedicated conservation unit as part of their courses. Within those, subject area B (Building Surveying) forms the largest group (9 out of 19). The second most
named answer to Question 1 represents sporadic reference made to building conservation issues during regular lectures or sessions not explicitly dedicated to conservation. Of the 12 counts for this item, eight course leaders report “sporadic reference” as the only conservation education item in their degree. Thus by far the largest numbers of responses were given to the two items on both extremes of the allocated tuition time scale. On the part of institutions and/or course leaders, this may indicate a tendency towards either committing fully to building conservation as an integral part of the education strategy for their respective built environment course, or alternatively making no formal commitment at all. Although several respondents report the dedication of one or more sessions (lectures) or projects and/or seminars to building conservation contents, these three items together only account for a quarter of the overall responses counted in Question 1 (11 out of 44).

**Question Two – conservation-relevant topics**

Question 2 aimed at exploring the building conservation-relevant topics most commonly discussed over the course of undergraduate built environment degrees (Figure 24). The range of answer items included topics from building conservation background such as heritage values, conservation philosophy and the relationship between building conservation and the property market, as well as implementary aspects such as actual conservation practice, redevelopment and refurbishment issues, building defects and historic materials as well as the legal conservation background (PPS5, now NPPF) and conservation-relevant applications and consents.

As illustrated by Figure 24, more than half of the respondents replied to six out of ten items, indicating a good general coverage of conservation-relevant topics. If itemised by course rather than topic, 18 (of 34) responding courses were found to cover six or more of the nine topic items listed, and of those, eight cover all listed topics. Of the 18 covering six or more topics, 14 are courses reported to feature at least one dedicated building conservation unit, unsurprisingly suggesting that a wide coverage of conservation-relevant topics is more likely to occur if presented as a dedicated unit than in other presentation formats.
Figure 24 further reveals that the five highest-ranked items (Refurbishment/redevelopment issues; building defects and materials; conservation practice; application and consent process; law and PPS5 [NPPF]) all refer to what could be called the “business end” of building conservation, concerned with the practicalities and complications of immediate implication. In the context of general built environment courses (i.e. not specialising in conservation), this suggests that within the limited amount of time available to the in-class discussion of building conservation contents (see also results Question 5, p. 131), precedence seems to be given to practical topics and issues over those of a more theoretic nature.

Question Three – curriculum decision making

Question 3 aimed to bring to light the most influential players in the decision making process over the inclusion of building conservation contents into (or their omission from) a built environment degree. This question was designed to establish a base knowledge about key course curriculum decision makers within an
institution, taking into account external factors such as partnerships with organisations and/or initiatives and accrediting bodies in particular. The results of this question inform the Conservation Game development and marketing strategy outlined in Chapter 6.

**Qu. 3: Responses to key course curriculum decision makers**

<table>
<thead>
<tr>
<th></th>
<th>No. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>accrediting body</td>
<td>18</td>
</tr>
<tr>
<td>external factors</td>
<td>6</td>
</tr>
<tr>
<td>lecturer</td>
<td>11</td>
</tr>
<tr>
<td>course leader</td>
<td>22</td>
</tr>
<tr>
<td>course committee</td>
<td>19</td>
</tr>
<tr>
<td>departmental policy</td>
<td>5</td>
</tr>
</tbody>
</table>

*Figure 25: Survey Question 3 results*

As illustrated by Figure 25, within the limited data points provided by this survey, the course leader is reported to be most influential in the design of his/her respective degree, closely followed by and thus most likely in strong cooperation with a course committee. In contrast, departmental policy seems to be of limited influence on the decision of whether or not to set an emphasis (regardless of size or depth) on conservation within a given course structure. Interestingly, professional accreditation bodies such as RICS and CIOB are seen to not only take keen interest in the inclusion of specific topics into a course, but also assert their priorities actively through the accreditation process. This finding suggests that in order to promote a successful Conservation Game, the cooperation and support of academics and accrediting bodies needs to be sought in equal measure (see also section 6.4 (p. 227).

**Question Four – modes of teaching**

Question 4 addressed the way of delivery by which built environment students were (and are) being introduced to building conservation concepts and issues as
part of their degree, be it through lectures held by regular staff, through guest speeches, case studies, site visits, peer project work or, relevant to the Conservation Game, role play and/or simulations.

**Qu. 4: modes of teaching building conservation contents**

<table>
<thead>
<tr>
<th>Mode</th>
<th>No. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>2</td>
</tr>
<tr>
<td>role play/ simulation</td>
<td>2</td>
</tr>
<tr>
<td>peer education</td>
<td>5</td>
</tr>
<tr>
<td>site visit</td>
<td>21</td>
</tr>
<tr>
<td>case studies</td>
<td>22</td>
</tr>
<tr>
<td>guest speakers (lectures)</td>
<td>16</td>
</tr>
<tr>
<td>regular Staff (lectures)</td>
<td>32</td>
</tr>
</tbody>
</table>

Figure 26: Survey Question 4 results

Apart from the two respondents who had already reported the absence of any building conservation education as part of their courses in Questions 1 and 2, all responding course leaders stated regular members of staff to be in charge of conservation education. In addition, case studies (22 of 34; 65%) and site visits (21; 62%) are reported to be popular means of introducing students to conservation concepts and issues. 16 course leaders (47%) claim to invite guest speakers to help cover building conservation content in addition to lectures held by regular staff. The two items characterised by a large degree of student-led learning (peer education and role play/simulations) proved least popular.

If laid out in a matrix against the presence of conservation units in courses, the response data shows that two thirds of conservation guest speakers (10 out of 16) are invited to courses featuring one or more conservation units. Three out of five cases of peer education projects take part within a conservation unit, as do both of the reported role plays. While not entirely surprising in itself, this finding stresses the point drawn from the result of Question 2 that a larger amount of time dedicated to conservation education (as afforded by the provision of a dedicated
unit) increases the width and depth of topic coverage and allows for a more varied and at times interactive learning environment.

**Question Five – obstacles to the introduction of conservation content**

The final question of this survey was aimed at discovering the main obstacles to the inclusion of building conservation content into new and existing built environment degrees, such as the relevance of conservation for the respective course, the difficulty of balancing learning outcomes on a programme level, curriculum (in)flexibility and the availability of engaged members of staff, experts and other resources (Figure 27).

**Qu. 5: Obstacles to the introduction of building conservation contents**

<table>
<thead>
<tr>
<th>Obstacle</th>
<th>No. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>not relevant</td>
<td>8</td>
</tr>
<tr>
<td>learning outcomes</td>
<td>13</td>
</tr>
<tr>
<td>inflexible curriculum</td>
<td>12</td>
</tr>
<tr>
<td>staff interest/knowledge</td>
<td>9</td>
</tr>
<tr>
<td>lack of experts</td>
<td>7</td>
</tr>
<tr>
<td>lack of resources</td>
<td>6</td>
</tr>
</tbody>
</table>

*Figure 27: Survey Question 5 results*

The main obstacles were seen in achieving a good balance of learning outcomes across the entire degree and the inflexibility of given curricula. Both these aspects relate to a notion that any given course at university is complex enough, or indeed too complex in its own right without the introduction of more marginal, multidisciplinary learning foci – as is indeed the fourth-ranked question item, which refers to the perceived relevance of building conservation to the course. 19 out of 34 course leaders refer exclusively to one or more of these three items, which could be seen as a somewhat narrow-minded approach towards built environment
professionalism in the sense that professions tend to be strictly separated from each other.

In the light of the results from Question 3 which suggested that regular lecturers were most commonly responsible for introducing students to building conservation issues, the fact that the item on staff interest and/or knowledge in and of building conservation ranks third in Question 5 is unsurprising. It is understandable that a lack of knowledge and/or interest of and in conservation on the part of academic members of staff would be seen as an obstacle towards the teaching of building conservation contents in built environment courses if it is mainly taught by said regular staff.

Interestingly, albeit ranking among the listed problems, the lack of conservation experts and/or appropriate teaching resources does not seem to be a major complication. This may suggest either that there are a sufficient number of conservation specialists available to support the teaching of building conservation contents, or that the conservation contents addressed as part of built environment courses lack the depth which would require the involvement of a specialist. The results obtained from the interview series in section 4.5 (p. 155), together with the indication from Table 3 that the presence of conservation expertise at an institution does not necessarily influence the depth of conservation teaching within built environment degrees at the same institution tendentially support the latter.

4.3.4 LIMITATIONS AND DISCUSSION

LIMITATIONS

The limited question depth brought about by the wish to contain the survey length as much as possible, coupled with a small sample size caused by the low response rate means that any conclusions drawn from the analysis of this data are of limited effectiveness in the classification of given phenomena. While the results may show evidence of trends or indicate a phenomenon, the small sample size does
not allow sweeping generalisation across the whole of the built environment education sector if solely based on this data. Therefore, Chapter 5 (p. 164) offers a synthesis of all data obtained in the research process and interprets any given findings based on a wider range of evidential material.

DISCUSSION

Overall, the survey data revealed an unexpectedly high amount of evidence of building conservation education, particularly in the form of dedicated units, compared to projections made after the inventory. The fact that over half of all respondents reported their course to contain at least one dedicated conservation unit compared to the high number of non-respondents suggests that the course leaders participating in the survey show an uncommonly distinct interest in building conservation concepts and issues. This introduces potential bias into the data which consequently means that any conclusions drawn from this data set may not be entirely applicable to the overall sample population (of undergraduate built environment course leaders), particularly the non-responders.

While the high count of conservation units was unexpected, Question 1 also suggests the practice of frequently shallow and unstructured conservation education, the delivery of which is commonly left to the judgement of the individual lecturer – an expected finding. The lecturer, while not necessarily as such influencing building conservation education on a course level, is nevertheless widely responsible for its delivery. Particularly in courses which do not feature dedicated conservation units, guest speakers and external experts do not seem to be commonly consulted. In the light of Question 5, which reports the “lack of experts” to be a minor concern in the decision process of whether or not to include conservation contents into a course, this may be regarded as an indication that lecturers with no or limited conservation expertise are deemed sufficiently qualified to present conservation contents within the boundaries of a built environment degree. Together with the unexpected number of conservation units, these findings indicate a tendency towards an “all or nothing” approach to structured conservation education as part of built environment degrees.
The results of Question 2 reveal an interesting trait of building conservation education in terms of the conservation-relevant topics presented to students as part of their built environment degree. It seems that practical topics, those which related directly to the immediate implementation of building conservation in practice, are more likely to be presented to built environment students than more theoretical background topics, such as heritage values or building conservation philosophy. While conservation purists may frown upon such an approach, arguing that informed judgement must arise from a solid grounding in theory, the RICS Practice Standards for historic building conservation (2009) in fact show a somewhat similar, practice-centered approach. In comparison to English Heritage’s Conservation Principles (Policies and Guidance, 2008), which thoroughly build on conservation and regeneration philosophy, the RICS practice standards (albeit undoubtedly informed by EH principles) are formulated in a more straightforward, practice-oriented manner, addressing concrete conservation aspects and procedures while maintaining an adequate level of reference to philosophical background. Both approaches are valid in their own right as they serve different purposes. Within the limits of the evidence provided by this survey, the built environment education sector seems to reflect a preferential tendency towards the RICS stance on conservation.

When matching all question results by course against the presence of one or more dedicated conservation units in the same course, an unsurprising pattern emerges. Generally, the increased tuition time afforded by the structuring of conservation contents into a dedicated unit means that the students are more likely to be introduced to a wider range of topics at greater depth, more likely to be taught by guest speakers (experts) and more likely to experience interactive learning.
4.4 Teaching Residential Building Conservation

In the autumn of 2010, the decision was reached to take over the teaching of the 3rd year optional unit *Residential Building Conservation* (Course: Property Marketing, Design and Development – University of Portsmouth, School of Civil Engineering and Surveying) for the academic year of 2010/11. This decision offered the unique opportunity of working intimately with a unit which in many ways is similar to the proposed Conservation Game. The course featuring this unit had been included in the list of 144 built environment courses established by the inventory (p. 109), and had been marked as one of the few which featured a full (albeit optional) unit on building conservation issues. Previously, this unit had been taught by Dr Zeynep Aygen, who in her main capacity was the course leader of the MSc Historic Building Conservation at the University of Portsmouth until 2012.

In being targeted at final-year undergraduate property students, being a dedicated conservation awareness unit and (previously) being taught by a conservation expert, *Residential Building Conservation* in many ways constituted a model unit for comprehensive conservation awareness training as part of a built environment degree in UK HE. As such, it was an interesting object of study, the value of which for this research was increased significantly by the opportunity to shape and present its contents.

In terms of this research, the **main benefits** of teaching this unit were seen in the opportunity to:

- become intimately familiar with the process of teaching building conservation awareness in a generic built environment course
- study, evaluate and re-shape the main focal points and taught contents of the unit (centre teaching and assessments around a key case study)
- observe students’ response to the teaching materials and methods
introduce a more engaging teaching strategy by planning and implementing a role play exercise as part of the teaching strategy as well as a field trip to the above mentioned case study object

observe the personal engagement of the students with the case study in response to the alternative teaching methods and field visit

COURSE and UNIT DETAILS

Course: Property Marketing, Design and Development
Year: 3
Unit: Residential Building Conservation (U15150) – option
Students: 51 students (13 female, 38 male)

4.4.1 CHANGES TO THE UNIT

As the unit had been run by a conservation professional with much experience in teaching the subject, most of the main topics covered in the unit in previous years were adopted at least in principle. In previous years, many topics had been presented by guest speakers (i.e. not the regular unit tutor), which generally has both positive and negative aspects. On the one hand, bringing in an active practitioner in the field can afford students a very realistic, practical insight into a given subject (Metrejean, Pittman & Zarzeski, 2002). However, in practical terms guest lecturers often fail to coordinate the contents of their presentations with other guest speakers, making a certain amount of overlapping information almost unavoidable. For the 2010/11 unit, a harmonious balance between unique insight and repetitive information was attempted by the author as the main tutor presenting the bulk of the topics/sessions, while two planning experts delivered a session each on the role of building conservation in the planning system and its respective legislative background.

The learning outcomes and assessment requirements put down in the unit file had to be adopted fully due to administrative restrictions. The main change made to
the unit structure in preparation of teaching lay in the incorporation of a central case study with field visit (see p. 137), around which the assessment strategy and a role play session evolved. In order to keep the case study as relevant as possible to prospective property professionals, it was designed as a residential redevelopment project of Fort Gilkicker, a major historic architectural structure.

In addition, most topics from previous years were re-evaluated and drawn up freshly to build what was believed to be (as close as possible to) a “model” curriculum for a conservation awareness unit. Over the course of the semester, this structure was applied in class, and amendments made where necessary. Starting with general, introductory aspects such conservation principles and heritage values, the session topics were arranged towards gradually getting more focused on practical aspects (materials, defects, repairs) and the case study.

4.4.2 CASE STUDY

The unit was centred on a single case study for several reasons: first, it would allow students to become very familiar with an architectural structure as well as the respective development project. The case study object would then become a rallying and reference point on which to better explain and demonstrate the practical application of the principles of building conservation and sympathetic repair and redevelopment. Second, this project-oriented learning would emulate “real-life” (in gaming terms) working environments, and thirdly, resemble the proposed Conservation Game in so far as the game would also build on the principle of learning by and from the experience of completing a development/regeneration project. Alongside obvious examples such as role playing and simulations, Meyers and Jones (1993) present case studies as an active learning approach which requires students to apply studied concepts in a practical fashion. Kreber (2001) argues that this experimentation and concrete experience as well as observation and conceptualisation afforded by well-presented case studies mean that students can become involved in all four aspects of Kolb’s experiential learning cycle (see Chapter 2, p. 35).
It seemed essential to pick an unusual architectural structure for the unit case study, which should be memorable, exciting, historically significant, accessible and well documented to provide both inspiration and challenge for the students in their roles as prospective developers and managers of architectural property. The choice fell on the Victorian Fort Gilkicker in Gosport (Hampshire) due to its intriguing layout, well documented history, convenient location and recent planning history. Fort Gilkicker is a Victorian Grade II* Scheduled Ancient Monument currently owned by Hampshire County Council and on English Heritage’s Buildings at Risk register.

The development project

One of the most significant factors in choosing Fort Gilkicker was its involvement in an ongoing (as of 2010/11) planning process for conversion into residential properties by the development company Askett Hawk Developments. The real development proposal outlines the conversion of the fort into 26 dwellings, resident’s stores and a ground-floor interpretation room open to the public. The proposal was granted planning permission in August 2010 (Holland, 2010, pp. 6-7). This proposed development formed the basis of the case study and role play. The students were briefed on a short history of the Fort, its physical layout and current state as well as an outline of the proposed development early into the unit.

Stakeholders

For the purpose of the case study, the six main stakeholders with an interest in the development were identified as:

The Landowner: Hampshire County Council (HCC)
The Applicant: Askett Hawk Developments
The Local Authorities: Gosport Borough Council (GBC)
Government Advisors: English Heritage (EH)
Government Advisors: Environment Agency (EA)

See www.fortgilkicker.com for site PR and marketing.
Local Interest Groups and Interested Persons

These stakeholders were designed to become a key feature of the role play element (as discussed in detail from page 141), as well as the assessment. The students were each assigned a stakeholder (with Gosport Borough Council as the decision maker reserved for the tutor) and asked to research and analyse the ideological backgrounds of their parties in the context of the conflict of interests thrown up by the proposed development. The students were to assume the role of their assigned stakeholder in a role play simulating a Public Consultation Hearing. A brief outline of the stakeholders’ positions was given to the students as a starting point for their investigation, indicating their stakeholder’s respective orientation towards the development. By and large, these orientations reflected the real life scenario of the actual development application, although the positions of Gosport Borough Council as the decision-making local authority and the one of English Heritage were slightly altered to allow for a more multifaceted discussion in the role play. The stakeholders were judged to be either in favour of the development (Landowner – [HCC]; Applicant – Askett Hawk Developments), opposing the development (Environment Agency; Local Interest Groups), or neutral and yet to be convinced (Local Authorities and session chair – [GBC]; English Heritage).

Field trip

In order to complete the students’ picture of the case study object Fort Gilkicker, to afford them a sense of scale as well as a first-hand insight into the current state of the building, and for a chance to meet and speak to a representative of the actual developer Askett Hawk, a visit to the fort was considered a critical aspect of the unit. The Fort as an architectural structure was judged to impress and inspire the students and trigger positive attitude and motivation towards the unit, role play and course work, as well as building conservation as a whole.
Both landowner (HCC) and developer (Askett Hawk) sent a representative to meet the students on site late in March 2011 and gave a tour while answering any questions brought forward by the students. Despite bad weather, the students were seen to enjoy the visit, and seized the opportunity to ask questions both in regards to general redevelopment issues and their assumed roles as stakeholders in the case study. Experiencing the fort first-hand seemed to underline the spectacular and unique nature of this development opportunity. Attendance was high, and many students later rated the field visit as one of the best features of the unit (internal unit feedback, University of Portsmouth, May 2011).

Figure 28: Impressions from Ft. Gilkicker field trip
4.4.3 ROLE PLAY

The role play element was included in the teaching strategy of the unit, both for the benefit of the students as well as the project, in order to provide a real-life relevant scenario with interactive capacities for the students to engage in (as discussed in Chapter 2, p. 68).

As previously mentioned, the role play scenario outlined a Public Consultation Hearing on the matter of the proposed development of Fort Gilkicker, to which all parties with an interest in the proposal had been invited to present their case, so that an informed decision on approval or declination of Planning Permission and Listed Building Consent could be made. The students were asked to advocate the positions of their respective assigned stakeholders on the day. The local authority, Gosport Borough Council, was to chair the hearing and was represented by the unit tutor (the author). The hearing was scheduled for the week after the field visit, to allow the students to incorporate their increased knowledge and understanding of the physical site into the discussion.

By being designed as a Public Hearing involving all stakeholders of the case study development project, the role play situation gave the students a genuine
reason to familiarise themselves with their given stakeholders beyond the requirements for the assessment (see below). It was designed further their insight into the complexity of planning arguments by experiencing a discussion, allowing them to listen to and judge other stakeholders’ arguments first-hand. The Public Hearing role play was set up to simulate a real-life situation, underlining the importance of understanding the concerns of all involved parties in order to broker a widely acceptable compromise. By design, the outcome of the hearing was left open in order to introduce a small competitive element to the role play. Despite being fundamentally inclined towards accepting the development proposal, the session chair (unit tutor, representing local authorities) would remain neutral throughout the discussion, and determine whether or not to support Planning Permission from the quality of the arguments brought forth by the students. If the project ‘opposition’ managed to be more convincing than its supporters, Planning Permission might not be (fully) granted.

The role play took place in a standard two-hour session. All students were asked to prepare the positions of their stakeholders individually in the lead-up to the hearing, so as to build up a variety of approaches towards each of the stakeholder positions. Since the role play situation required the students assigned to their respective stakeholder groups to work together as a team, they were given a 30 minute preparation slot at the beginning of the session, in which to streamline their arguments and potentially nominate a group speaker. During that time, the unit tutor was available for any queries students might have. Apart from the obvious points of contention surrounding the application (such as questions of design or flood safety), a number of discussion incentives were displayed to the students during the hearing. Role play research commonly outlines the importance of having both an introduction as well as a summary and reflection period as part of a role play session, which was implemented together with an introduction of general rules for the hearing.
In terms of benefits to the thesis project, the role play was immensely valuable in growing an understanding of the requirements of designing and implementing an interactive and topic- as well as real life-relevant learning experience in preparation for the Conservation Game (see Chapter 6, p. 178). Although by no means extensive enough to compare to the Conservation Game, this role play situation can be seen as a pilot study by allowing the test of a potential game application as well as the subsequent evaluation of the exercise by the participating students.

4.4.4 ASSESSMENT

As previously mentioned, the nature and extent of the assessment had been set out in the unit file and could not be changed within the given timeframe due to administrative restrictions. The assessment therefore had to be based on coursework with a word limit of 2500 words. In order to link the assessment to both the students’ research into stakeholders as well as their prospective job requirements as property professionals, the coursework was divided into two parts.

Part 1 – Stakeholders

This part of the coursework referred strongly to the above role play and the students’ research of their assigned stakeholders. The students were asked to present the position and key arguments of their given stakeholder in connection to the case study development, taking into consideration the respective motivations, project restrictions and potential counter-arguments of opposed stakeholders. Similar to the role play, this section was specifically designed to put the students out of their comfort zone by being required to consider motivations and perspectives beyond those of their own prospective profession as a developer in order to gain a wider understanding of conservation projects as a polarising, multi-party mediation effort to achieve the best possible compromise for all parties concerned.

Part 2 – Development Proposal

Part 2 of the coursework allowed students to put forward their own proposal for residential conversion of Fort Gilkicker. The students were asked to outline and
justify their proposed development approach, alterations, design and material choices, taking into consideration any planning restrictions such as Planning Policy Statements and EH guidance, as well as site characteristics. In order to achieve a feasible outcome, the students were asked to dedicate a part of section two to a critical self-analysis, considering their own approach, any positive and potentially negative implications and the impact of their project on the area, local community and the national heritage conservation effort. This requirement was intended to instigate the beginnings of a process of reflective decision-making as discussed in Chapter 2 (p. 41).

The second part of the assessment was designed to determine whether the students had understood the restrictions placed on a development surrounding a listed structure, and to evaluate how they chose to implement their designs under said restrictions on a residential scale. It also allowed students to show their awareness of the wider effects of their actions by delivering a well-considered impact assessment as well as providing an opportunity to showcase their presentation and illustration skills.

4.4.5 RESULTS and OBSERVATIONS

ROLE PLAY OBSERVATIONS

At the time of designing the unit, it did not seem feasible to include the role play into the assessment strategy, as the performance of individual students in a group discussion cannot easily be compared and evaluated (Lejk, Wyvill & Farrow, 1996). Although student attendance of taught sessions is compulsory by default at the University of Portsmouth, it fluctuates considerably in reality, due in part to the virtual impossibility of enforcing it effectively. With the role play not incorporated in the assessment strategy, this led to a less than overwhelming attendance of eight out of 51 students on the day.
Although only a handful of students attended the session on the day, (student) representatives of all stakeholder groups were present, and the role play was conducted much as it would have been with a full group. The participants had generally researched and prepared their arguments well, and the opening preparation period with chance to consult with the unit tutor seemed to dispel much of the initial anxiety. Although some of the students were reluctant to speak up at the outset, all of them became more comfortable and engaged after only a short while. This ties in with observations made at the Royal Marines Commando role play for children, as well as the structured learning environments of the Game Developer unit (Portsmouth University) and personal experience (see discussion in Chapter 5, p. 173). After the initial trepidation had worn off, the students seemed to enjoy the exercise and did not appear more reserved than usual. Indeed, some of the quieter students showed an increased level of active engagement. Despite the poor attendance, the exercise was judged to be a success.

STUDENT FEEDBACK

After the role play, the participants were asked to briefly give their opinion on the Public Hearing exercise in the form of an informal semi-structured group interview. Overall the students stated to have enjoyed the exercise, that it had increased their understanding the ‘bigger picture’ of the development project. They mentioned their appreciation of the role play’s relevance to real life situations, as well as the welcome fact that it broke up the monotony of regular lectures. The participants also largely agreed on having a more comprehensive understanding of the stakeholder positions after the Hearing, and the discussions did spark some new thoughts, which were generally reflected in the students’ coursework.

Surprisingly, the participants were familiar with the concept of role plays in built environment education; they reported to also have been set role play-like scenarios in other units. Most students of this degree course would therefore have been in role play situations before the Public Hearing. The poor attendance can therefore not be put down to the prospect of a daunting new situation, as the students would have participated in role plays before.
A reason could be seen in the suggestion made during the group interview that many students feel uncomfortable about speaking up in front of the class. It seems that despite having known their fellow students for almost three years, there was still a considerable amount of peer pressure not to stand out, be it in a positive or negative sense. Being asked to participate in a discussion may have triggered an evasive strategy in many students which coupled with a lack of strategic incentive for attendance in terms of negative impacts on their unit mark consequently led to poor attendance. Since the actual role play participants agreed to having enjoyed the session despite initial apprehension about speaking out and arguing a position, there is no reason why the other students should not have had a similar experience. It has to be concluded that there exists a considerable confidence barrier which effectively prevents adults in their final year at university from attending a potentially enjoyable and valuable experience. In retrospect, the role play element should have been a much more integral part of both unit and assessment strategy.

**General Observations and Recommendations**

An interesting phenomenon was observed in week 2 of the semester. Contrary to expectations, the session on heritage values and history of architectural conservation proved to be one of the most popular topics (with the field trip ranking highest). As this session was highly theoretical bordering on conceptual, it seemed a given that students’ attention levels would drop rapidly, as is commonly the case with such lectures. However, there appeared to be a genuine interest in the concept of heritage and the reason for its widespread recognition and valuation. Indeed this session was imbibed much more easily than some of those on more practical applications of building conservation. Later, in a conversation with Dr Aygen suspicions were raised that this might be attributable to the students’ interest in making a good living out of property development, which could have been triggered by concepts such as value and marketing of heritage.
During coursework assessment, it became apparent that some students’ attitude towards building conservation as part of the construction industry and property market had not improved significantly. While a large number of students had clearly come to understand and appreciate the deeper reasons behind building conservation, such as concepts of value, authenticity and integrity, other works regularly contained comments such as ‘to keep English Heritage happy’ as a justification for design decisions in part 2 of the assignment. While complying with EH recommendations and requirements is a critical aspect of any development surrounding a historic structure, it should ideally be seen as more than just a means to an end (which is usually to gain planning permission and subsequently make money). At times, English Heritage seemed to be perceived as a (minor) nuisance to be dealt with during the development process, rather than a genuine guardian of a shared cultural heritage. Although this result confirmed earlier suspicions about how architectural conservation may be perceived by built environment students, it also means that a number of students did not meet one of the unit’s most central learning outcomes: the appreciation of building conservation for its own sake and for its social, historical and cultural merits. It should perhaps be repeated at this point that building conservation as an institutionalised practice rather than a concept is by no means an uncontroversial subject, and has fierce supporters as well as opponents inside as well as outside of the property and construction playing field (see introduction and section 2.1, p. 13). The above result should therefore be taken as a reflection of this conflict rather than the failure of the conservation unit, particularly since many students showed a high level of understanding of conservation in proposing sensitive and considered development approaches.

A direct comparison of the students’ unit marks with the attendance records of the role play session did not reveal an apparent connection between participation in the Hearing and increased coursework performance over those students who remained absent for the role play. The marks of the attending students included all pass grades in a rough bell curve, thus mimicking the overall class performance. However, the participating students seemed to give a more inclusive overview over
the given stakeholders in their coursework essays, suggesting that while a single role play session may not improve overall performance, it may contribute towards the understanding of the particular aspect captured in the role play. It is also possible that a one-off role play session, which (taking into consideration the “administrative” time spent on introducing and setting up the scenario as well as summary and reflection time at the end) lasts just over an hour, is not enough to engage weaker students to an extent where improvements can be seen in their coursework performance.

Overall, the experience of preparing for and teaching this unit has revealed one aspect in particular detail. The unit in question is organised in sessions of two hours per week over the course of an academic semester, thus being subject to common attendance fluctuations around holidays and hand-in/exam times. Coupled with the complexity of the subject, this means that students can indeed only be made aware of the issues surrounding and defining Building Conservation at a very basic (threshold) level. Realistically, the amount of hard, in-depth conservation knowledge students can gain from this unit is negligible. On the one hand, this result was highly predictable. On the other hand, it will, in all likelihood, be unnecessary for a large majority of built environment students to possess in-depth knowledge about particular repairs to specific defects as well as the characteristics of specialist materials and technology. Thus, the focus of the Conservation Game must lie with a) establishing an awareness of the reasons for conservation and outlining core national conservation principles and good practice, b) reinforcing the importance for true understanding of a project (outlined in Chapter 2 and suggested in Chapter 6, p. 195), and c) establishing an understanding of conservation project processes and their implications for project management as well as the built environment in general. If these aspects are sufficiently communicated to students, they should form a solid basis for making informed decisions when faced with conservation sensitive projects and instigate interest- or need-driven further personal research into the subject. In this context, it will also be essential to stress the significance of English Heritage as a powerful stakeholder in UK conservation.
projects, a fact which seems to be generally and at times considerably underestimated by built environment students.

If the above mentioned core awareness of conservation principles and processes can be packaged into an immersive, interactive digital learning environment, the confidence barrier holding students back from engaging in a group role play would be considerably lowered due to the relative anonymity of a game environment. A game, which would effectively constitute a role play covering a multitude of topics rather than just a single aspect of conservation (as mentioned in the previous paragraphs), would arguably be more effective in introducing students to integrated concepts than a single role play session. Within the immersive structure of a game, students could explore these related concepts in a meaningful, practice-related learning environment as proposed by Dewey (p. 36) as well as by Shaffer’s Epistemic Games (p. 70).

4.5 Interviews

To round off the data collection, a series of interviews with built environment (education) sector practitioners and experts was implemented as a qualitative tool to follow up on and flesh out the data previously collected in stages 4.2 (p. 103) through to 4.4 (p. 135). Semi-structured interviews were conducted with ten representatives of the built environment industry and its related regulatory and educational apparatus in a one-to-one conversational format at locations convenient for the respondents. The semi-structured interview design is commonly applied in flexible research designs to allow the interviewer a measure of control over the procedure by making sure that the all the desired topics are covered, while retaining the flexibility to probe and follow up on new information coming up during the interview (Robson, 2002, p. 278).
4.5.1 AIMS & OBJECTIVES

The aim of conducting the interview series was to formulate a more comprehensive understanding of the practice of building conservation education relating to built environment degrees based on the course inventory (section 4.2.3, p. 107) and its relevance for the built environment sector. In part, the interviews were designed to follow up on responses given during the questionnaire stage, and to map the necessity for building conservation awareness to be generated at a higher education level. The main themes explored were those outlined in Chapter 3 (p. 94): the reality of current building conservation education in HE, its necessity in order to facilitate processes in the built environment industry, the practicality of implementing a new Conservation education programme and the feasibility of doing so. Analysis of the dependencies flow chart (Figure 14) on page 95 identified four major groups of players in the force field of building conservation, its education and the industry (not taking into account those still in education). These four groups were translated into four interview respondent groups:

- Educators of built environment aspects in HE
- Practitioners in the built environment industry (not conservation specialists)
- Regulators of the Planning, Property and Surveying sector
- Regulators and practitioners of the building conservation sector

By interviewing a number of members from all these groups, it was possible to address a wide range of aspects such as best case scenarios, actual implementation of educational practices and necessity for and practical use of building conservation skills and knowledge for the general built environment practitioner.

4.5.2 INTERVIEW DESIGN

The interviews were designed to be conducted in a semi-structured format over the duration of approximately an hour each. Following Robson’s guidelines (2002, pp. 273-282), the questions were laid out to be simple and straightforward in an attempt to avoid ambiguity and bias as much as possible. As the interview process
at times necessitates the researcher to react to the respondent and leave the prepared question structure and layout in order to follow up on new information, bias is difficult to rule out completely. To minimise this, the questions were prepared together with a number of potentially useful probes and prompts in some detail before the actual interviews.

While generally aiming to elicit responses relevant to the four main research themes (reality, necessity, practicality and feasibility), the questions were grouped into eight variant topics related to the overall topic of building conservation education in built environment degrees. Those eight sub-topics include:

1. **Background of the interviewee**  
   (Description of the interviewee’s current professional role, previous career paths and relevant education)

2. **Opinions on building conservation values**  
   (General and personal)

3. **Building conservation for built environment professionals**  
   (Reality, practice, significance)

4. **Building conservation for built environment degrees in HE**  
   (Reality, practice, significance)

5. **Opinions on building conservation in built environment degrees**  
   (General and personal)

6. **Prospect of introducing a national HE programme to raise building conservation**  
   (Opinions, perceived benefits and disadvantages, issues and requirements)

7. **Building conservation education outside of Universities**  
   (Awareness of/experience with) available programmes, providers

8. **Statements**  
   (Opinions and comments on two statements selected by the researcher)

The majority of questions were presented in a traditional format with the exception of the above section 3 which included an interactive element in the form of a number of built environment professions (identified from the study of the course inventory presented in section 4.2.3, p. 107) and printed on separate slips of
paper. The respondent was asked to rank those according to the degree of exposure to building conservation practices each of these professions were likely to have. While the same ranking could also have been achieved by asking the respondent to number a list, the more interactive approach was designed to be more flexible, responsive, engaging and thus more interesting than the pen-on-paper option.

In Section 8, the respondent was presented with two statements regarding the influence of building conservation on the built environment sector:

**Statement 1:**

*Around a third of all planning applications per year potentially impact the built heritage.*

Kate Clark, Planning for the past: Heritage services in local planning authorities in England (2001, p. 63)

**Statement 2:**

*Aspire ‘that the value of the historic environment is recognised by all who have the power to shape it’*


The respondent was asked to comment on the feasibility and credibility of these statements and relate them to each other as well as the higher education of built environment professionals.

The interview question structure was further divided into a set of general or core questions, which remain the same for every participant, and four different sets of variable questions tailored more specifically to the four participant groups (Educators; Practitioners; Regulators – Planning, Property and Surveying; Regulators – Building Conservation). In order to retain a maximum amount of comparability, the questions were designed to be as similar as possible between the groups within the requirements for each respondent variant. For more detail, see the interview structure and question layouts in Appendix D.
4.5.3 INTERVIEW PILOT

For the pilot, a senior lecturer from the University of Portsmouth was invited to participate. The pilot respondent was similar in profile to the main interview respondents in the Educators group, but was not intended to participate in the main data collection due to a lack of experience in degree course planning and management. The respondent had an industry background in architecture and worked as a senior lecturer for design-, regeneration- and planning-related subjects on undergraduate and postgraduate property and surveying courses at Portsmouth University. The interview question subset for Educators was employed due to the respondent’s professional appointment at the time.

The interview lasted just under an hour. During the interview, the question order was changed according to what felt appropriate at the moment in response to the answers given by the participant. Some questions were skipped altogether due to differences in profile between the pilot respondent and intended main respondents, as well as time restrictions. The wording of some questions did not fully explain the intent of the researcher and required the respondent to ask for clarification. While any confusion on the part of the respondent is undesirable, it did not significantly impede the interview process. However, it meant that the prepared question structure had to be left on occasion, as indeed also at times caused by the participant’s responses. Where the question structure was left, questions were prone to becoming leading, particularly as the prevalent opinion expressed by the respondent was that of support and approval of building conservation education in universities. This resonated with the researcher and elicited a feeling of understanding and fraternity, making it hard not to sympathise with the respondent and thus risking bias. This issue was marked as a particularly important aspect to consider and avoid in the main interview series.

Changes made after the pilot

A full explanation of the proposed game programme was not originally planned to be included in the interviews over concerns of bias. However, it became clear
that participants would not be able to accurately and satisfyingly answer certain questions (particularly in section 6 of the interview structure) unless they were acquainted with at least an outline of the proposed programme. An explanation of the programme was therefore given at the start of section 6 in the course of an interview. Placing the explanation at the beginning of the interview could have led to biased responses due to the participants’ knowledge of the interviewer’s wider intent.

Question wording was changed in some cases to improve understandability. As interviews are hard to predict, some questions were further earmarked as potentially expendable in order to be able to deal with potential time restraints on the day.

4.5.4 PARTICIPANT SELECTION and IMPLEMENTATION

For the interview series, 12 built environment (education) specialists (three for each of the four groups outlined in section 4.5.1, p. 150) were selected as a representative range of knowledge and attitudes of and about building conservation in general UK built environment practice and higher education. The participant selection included representatives of built environment degree courses, English Heritage, RICS, CIOB and IHBC as well as local and regional practitioners. To minimise bias, the selection was designed to include both open supporters of historic building conservation as well as representatives of groups who showed no outward commitment to building conservation, or whose attitude to the subject was unknown.

The prospective participants were invited to individual face-to-face semi-structured interviews designed not to exceed one hour of conversation time, at a time and location of their choosing. The invitation was received favourably in most cases, with only two invitations being rejected. As the remaining interviews were conducted and towards the end of the series began to produce repetitive information, the decision was taken not to pursue replacement candidates for the
two rejections. The interview series thus consists of conversations with three educationalists, three regulators (conservation), two regulators (surveying/planning) and two practitioners. The overall structure of the interviews remained largely the same, although some adaptations were made to the questions according to the participants’ professional background, as well as in response to the actual interview progress on the day. All interviews, two of which were conducted over the phone, were recorded under permission from the participants and transcribed for analysis. For the full participant information letters and question outline, please see appendix D.

4.5.5 RESULTS and DISCUSSION

As the professional background of the participants and consequently their responses to interview questions varied considerably, this section will present commonalities and themes emerging from the data rather than a blow-by-blow account of each question. In Chapter 5, these themes will then be aligned and synthesised with the results gathered through the other research tools presented in Chapter 4 against the backdrop of the four research criteria (necessity, practicality, feasibility and reality) outlined in section 3.3 (p. 94).

Irrespective of their professional background, all respondents claimed to support the concept of historic building conservation as a valuable contribution towards society or economy, or both – albeit some more fevered than others. One respondent (not a conservation specialist) called the historic environment the ‘fabric of culture’, indicating deep personal conviction. This result was unforeseeable in that the participant selection consciously included people who had no professional association with building conservation and/or no obvious reason, be it economic interest or perceived norms imposed by a social circle, to support it beyond their personal interest. While the sample size of this interview series does not necessarily equate to a representative proportion of all built environment specialists in the UK, this result indicates a widespread appreciation of the historic built environment as discussed more fully in Chapter 5 (p. 164).
VALUES

When more specifically referring to actual values, both general and personal, attached to the historic (built) environment, the responses show greater differentiation. While all participants mention the term value (or values) in relation to the protection of the historic environment (unprompted by the interviewer) at least once, the corresponding associations are commonly divisible into cultural and economic values similar to those described in section 2.1.1 (p. 16). The examples named for cultural values are familiarity, loyalty and, as put frequently throughout the interview series, emotion. Economic values include references to financial value, practicality and economic success of re-use and sustainability – these tend to be much more specifically presented than cultural values. Somewhat unsurprisingly, cultural values were mainly brought forth by those participants with a professional background in heritage and building conservation, while general (present and former) built environment practitioners showed a tendency towards referring largely to economic values. In many ways, this result mirrors the difference between EH and RICS conservation guidance in that conservation specialists take an idealistic stance while general built environment practitioners seem to prefer a more practical and/or practicable approach to conservation.

Along the lines of conservation values, the word nostalgia appears frequently in the vocabulary of those not specialised in building conservation. Nostalgia, as discussed in the literature (p. 21) carries with it the distinctly negative connotation of a hopeless infatuation with the past and its remnants, yet at the same time seems to be a commonly used term in the description of building conservation by (conservation) laypeople. Nostalgia was also used regularly in close proximity to emotion and 'being emotional' about conservation. However, while the term was frequently employed during the interviews, it was never used in an outright derogative fashion.

This contradiction allows for two related suggestions. Firstly, the common use of the term nostalgia in a largely positive context indicates that it has assumed a much
more favourable air in common parlance than it has in academic literature. Secondly, the easy and in two cases exclusive association of nostalgia and conservation also suggests that the true philosophical and cultural background of architectural conservation is not understood by conservation laypeople to its full extent. Despite general appreciation and even enthusiasm, little actual knowledge of conservation principles becomes apparent in any of the interviews with conservation laymen. Moreover, even the friendly association with an in essence derogatory term paints building conservation in a less favourable light than need be, and may in part be responsible for the conservation sector’s image problems outlined in the NHTG report (2008, p. 13). An improvement of the general practitioner’s view of building conservation would certainly benefit the sector, particularly as conservation was also stated in an interview to be ‘anti-capitalist’ and an obstacle to the ‘bean counters’, or ‘brick counters’ – those in charge of project costing.

SKILLS and AWARENESS

Across the board, all participants agreed that built environment professionals should be aware of heritage and building conservation at least on a basic level, and that there is definite potential for the profile of building conservation to be raised in higher education. The participating educationalists were particularly vocal in stressing the importance for students to have a full understanding of their sector and the relevant debates (including building conservation) in order to be able to participate in said debates. As one respondent put it, ‘I think there is a duty in education to teach these students about the issues [of building conservation] so that they can actually go ahead and do it [their job] with a bit more of a conscience’. In connection with necessary conservation skills, the term awareness was used in nine out of ten interviews, with one respondent stating that ‘awareness is really important for them [the built environment students], even if in practice they’re not carrying out work in that field [building conservation]’. Knowledge about a topic was quoted to lead to understanding and valuing of the same.
However, while there was overwhelming support for the development of conservation awareness, participants disagreed over the extent to which more in-depth conservation skills and knowledge should, or indeed could be included in built environment courses. Similar to the survey results (see p. 131), the difficulty of correctly balancing all learning outcomes at programme level over the restricted timescale of a degree was mentioned as the most prominent deterrent to the inclusion of building conservation contents. While conservation skills were quoted to be ‘very, very relevant’, there are many more topics more directly related and/or relevant to a given professional practice, some of which have to be sacrificed in order to be able to include conservation education. However, three respondents referred to a trend in the sector towards greater cross-professional cooperation and trans-disciplinary work (see also: Baker & Chitty, 2002; NHTG, 2008) and expressed their wish for built environment education to become more holistic.

Despite supporting a general increase in conservation awareness in principle, a number of respondents (four out of ten) did not believe that graduates would universally benefit in their job search from having developed building conservation skills during their respective built environment degree. Whether or not supplementary conservation education at university increases a graduate’s employability seems to be largely dependent on the respective employer, as the built environment sector is very varied and puts a general emphasis on new-builds. This sentiment was shared by eight out of ten respondents. One respondent facetiously referred to the much-used ‘delightful little term “brown field sites”, which indicates that whatever building was on there [the plot] we’ve knocked down and started again’.

CONSERVATION in the BUILT ENVIRONMENT SECTOR

In a way, brown field sites are the antithesis to architectural conservation, so from a conservationist’s point of view it is reassuring to see that eight out of ten respondents remarked favourably on the benefits of re-use and heritage-led regeneration, often in connection with economic values. The sustainability of the
re-use of historic buildings in the sense of preserving embedded carbon was quoted by six respondents both with and without specific conservation expertise. This could be seen as a result of an increasing number of heritage regeneration information campaigns such as English Heritage’s *Heritage Works* programme (2008) or the extensive report on the impact of historic environment regeneration by Amion Consulting (2010).

Just how widespread conservation-relevant projects are across the UK built environment sector is illustrated by the fact that all respondents claimed to have worked on at least one project involving a sensitive historic structure during their career (with all interviewed educationalists having been practitioners before joining university staff). Nine out of ten reported to have worked on more than one of said projects. This may explain why all respondents were in favour of increasing conservation awareness in (prospective) built environment professionals and in some ways validates Kate Clark’s statement that approximately a third of all planning applications per year impact on the historic environment (see also section 4.5.2). It is also a graphical reminder of the necessity for built environment professionals to have developed solid conservation understanding before embarking on a conservation-related project and not as stated both by five interviewees and mentioned in the NHTG report (2008, p. 65), to learn about conservation ‘on the job’. Three respondents stated that going into a heritage-sensitive project without knowing what to expect would most likely lead to negative experiences and conflict with the conservation authorities, consequently having a negative impact on the project.

Despite the apparent demand for conservation know-how in the current UK built environment sector, all participating conservation specialists lamented the lack of capacity in the sector in regards to providing suitably qualified conservation managers or consultants, which ties in with the lack of conservation officers (EH, 2000, p. 34) and reported recruitment difficulties for conservation specialists (NHTG, 2008, p. 63). One respondent called for the education of conservation
‘paraprofessionals’ to alleviate the strain on specialist human resources while maintaining a high quality level in regards to the work carried out in the historic environment. While the proposed Conservation Game may not be sufficiently detailed enough to create such paraprofessionals, it may nevertheless through sheer exposure to (virtual) conservation projects spark a player’s interest in the topic and consequently promote educational routes into conservation specialism.

One phenomenon observed in both conservation specialists and conservation laypeople during the interview process was the frequent mentioning of the term traditional building stock or traditional buildings interchangeable with or indeed instead of the more legislation-specific term of listed buildings. The particular associations with traditional buildings, similar to the observations made previously on values, are twofold. Conservation specialists refer to traditional rather than listed perhaps out of appreciation for the rejected Heritage Protection Bill (2008/09) and the Penfold Review (2010), both of which champion the administrative concept of significance and relative significance in favour of the in-or-out principle of listing. This threshold imposed by listing was mentioned by one respondent as a barrier to understanding the historic environment, as it is difficult for laypeople to appreciate what exactly constitutes that particular threshold.

The responses of conservation laypeople in relation to traditional buildings revolved largely around the physical aspects of buildings such as construction methods and materials, emphasising once again the practical aspects of conservation over philosophical ones. In terms of promoting the protection of the historic built environment with students, this tendency signifies a challenge as well an opportunity. Preaching background philosophy to people who may not even be interested in a topic in the first place will most likely fail to make an impression. As one respondent put it, ‘they [the built environment students] need to know how it [building conservation skills] will help them, otherwise they just won’t be interested’. In terms of informing practitioners about building conservation, an experiential approach which utilises philosophical background information to explain experiences may prove more successful than starting on theory. This approach
would go in tandem with calls for relevant practical learning in context, as mentioned by six interviewees as well as stated in the literature by the likes of Dewey (see p. 36) and Shaffer (p. 71).

Indeed, without yet having been introduced to the concept of the Conservation Game, one respondent (representing the RICS) referred to learning environments which allowed for engagement and reflective practice, stating that ‘our experience has shown that this is the proper way to acquire skills in conservation management’. This confirms the author’s suspicion and supports the Conservation Game proposal. The same respondent further mentioned the RICS’s interest in modular online learning for applications such as CPD programmes, which links up with the NHTG’s findings of practitioners’ use of the internet as a primary learning source on conservation topics (2008, p. 65).

FRAGMENTATION

The fragmentation of the built environment sector into individual, largely contained professional practices as became apparent in section 4.2.3 (from page 107) was mentioned by four interviewees, largely in connection with the aforementioned wish for closer cooperation and trans-disciplinary work. Similar to the author’s conclusions drawn from the inventory and course leader survey, three of said four respondents hold this departmentalisation directly or indirectly responsible for a lack of team building and project managing skills. One respondent described the individual professionals as not seeing the forest for trees, as they lack the ‘bigger picture’ of relevant processes and current debates in the sector. Two respondents attributed these trans-professional perspective deficiencies in large parts to the equally fragmented higher education system, which is said to focus on drills rather than vision. As one respondent explained: ‘You can train in terms of a task and knowing how to process a task, that’s what training is for, but education actually equips you to both design and manage tasks and to also develop yourself to
do that. What the education sector is providing us with, more or less, are people who are trained, but not educated’.

While the above result was somewhat predictable through the literature and the previously discussed research stages, this sector fragmentation also manifests itself in a more covert way, which was discovered in the process of designating potential interview candidates. In terms of organisation structure, building conservation is entirely disconnected from education in two of the sector’s most influential bodies: English Heritage and the Royal Institute of Chartered Surveyors. In the case of EH, Education is teamed up with Interpretation and focuses a bulk of its efforts around primary schools, both on pupils and teaching staff. A follow-up question in relevant interviews suggested that as of this point, their education strategy makes no provision for reaching out to higher education, and is not expected to do so in the near future. Entirely removed from that, the Conservation branch of EH works on improving conservation awareness and skills but has no input into the formal education strategy and also fails to reach out effectively to HE. While perhaps less remarkable due to not being the key national building conservation body, the RICS’s organisational structure removes their respective education department from their Building Conservation Forum just as effectively. This isolation of building conservation practice together with a failure to promote conservation awareness at undergraduate HE level may well be instrumental in the creation of built environment professionals who to a large part feel inadequately prepared to take on projects involving pre-1919 (i.e. traditionally built) structures as outlined in the NHTG report (2008, p. 63).

NOTES

The above discussion of results does not take into consideration the answers given to the questions which asked for rankings due to the disparate nature of responses. Only three respondents actually ranked the professions in terms of their perceived exposure to building conservation projects with vastly different results, while most other respondents showed a tendency to pick out one or two
professions they felt comfortable talking about and concentrated on those. Similar observations were made when asking interviewees to rate the importance of building conservation knowledge for students and practitioners, where the participants frequently neglected to specify a number and instead focused on a lengthier, at times tangential explanation. After seven interviews, the ranking questions were dropped from the interview schedule.

All the results from Chapter 4 are synthesised with findings from the literature and analysed in terms of their implications for the Conservation Game proposal in Chapter 5.
CONSERVATION APPRECIATION in and beyond built environment HE

One of the most general and at the same time most significant findings lies in the widespread and trans-professional recognition of the significance of the historic built environment and general appreciation of its protection. Despite their varied professional background, all interview respondents supported architectural conservation as a valuable form of heritage management and were observed to speak affectionately about the historic environment. In this, the historic environment demonstrates its inherent power of emotional engagement and in doing so illustrates the base on which conservation appreciation must build. At the same time, this finding mirrors what Lowenthal (1985) would call the UK’s contemporary infatuation with the past and all its remnants as discussed in Chapter 2, (p. 14) and as evident (among others) from a multitude of televised programmes on history, traditional crafts, archaeology, antiques and indeed restoration and building conservation.35. The commitment to protect and enhance the historic environment for future generations is continuously championed by English Heritage as well as the 77 non-government organisations forming the Heritage Alliance and acknowledged in the government’s current National Planning Policy Framework.

If one was to leave it at that, one could only conclude that the combined efforts of heritage organisations and government policy are indeed doing a marvellous job at sowing and growing conservation appreciation across the built environment sector. However, this general enthusiasm unfortunately often becomes rather theoretical under close scrutiny. While all interview participants for example agree that built environment practitioners should be aware of building conservation issues and processes and that the discussion of such during formal professional

35 See for example recent factual television series such as „Antiques Roadshow“ (BBC One, 1979-2012), „Beeny’s Restoration Nightmare“ (Channel 4, 2011), „Great British Railway Journeys“ (BBC Two, 2010-2012), „The Restoration Man“ (Channel 4, 2010-2012) and a great number of history documentaries (notably on BBC Four), as well as more popularised ‘costume drama’ such as “Downton Abbey” (Carnival Films, 2010-2011) or “Upstairs Downstairs” (BBC One, 2010-2012);
education would be beneficial to aspiring practitioners, the actual introduction of building conservation contents into HE curriculum structures is met with considerably greater reluctance.

Based on openly available information on websites of higher education institutions, only one in six built environment courses currently offers dedicated modules or units on architectural conservation and/or heritage-led regeneration (section 4.2.3, p. 116). While results from the course leader survey (p. 123) suggest that the number of unknown cases may be up to two times higher (survey results compared to inventory), they reveal in the same breath that where conservation education is not condensed into a unit or project, it is only implemented sporadically if indeed at all. The provision of building conservation education may thus not be a course aspect which is particularly well publicised. Similar notions could be observed during the interviews, where two respondents noted the low student uptake of building conservation unit options. Such results suggest (and underline, see below) the somewhat unpopular image of architectural conservation within the built environment education sector. As a consequence, it has to be assumed that most building conservation education over the course of built environment degrees is inconsistent, unstructured and lacks depth and as such is unlikely to leave a lasting impression with students.

The reasons most commonly associated with this lack of commitment to building conservation education as a built environment degree supplement centre around the perception of relevance, and are as such connected to the above public image of building conservation. In the course leader survey, more than one in three respondents stated the difficulty of balancing learning outcomes across programme level to be one of the main reasons not to include conservation education in a course (p. 131), tying in closely with results from the interviews (p. 157). The complexity of contemporary professional education undoubtedly places strains on curriculum makers over which aspects to include and which to neglect, a general notion being that there is simply too much to cover. Although fewer survey
respondents (one in four) reported the lack of relevance of conservation to their respective professional practice, these two aspects are nevertheless closely linked. The decision over course contents rests largely with the course leaders, who, aided and restricted at times by accrediting bodies select course subjects in accordance with their own perception of relevance. If the extent of traditional construction and conservation-sensitive projects and their impact on the built environment sector were communicated more effectively, course leaders and accrediting bodies alike might be more inclined to consider conservation awareness education in the spirit of demands for increasingly holistic higher education practices (Newton, 2009, p. 103; also: Chapman, 2009; Klostermann, 2011). The fact that some universities have made this choice testifies to the possibility and feasibility of building conservation education as part of built environment courses.

Through its associations with age and obsolescence, architectural conservation is constantly under threat of being perceived (particularly by built environment practitioners) as backward-looking, restrictive and militantly traditionalist. The NHTG report lists ‘positive image’ of the historic built environment and its protection (as discussed previously) as a key improvement target in order to increase recruitment in the conservation sector (2008, p. 94) – recruitment which is direly needed (EH, 2000, p. 34). In full agreement, the author proposes the Conservation Game as a means of illustrating to prospective built environment practitioners the relevance of and reasoning behind architectural conservation in an entirely non-traditional context in order to underline that conservation can be contemporary, interesting, involving, motivating and even fun.

The above improvement of the image of building conservation among built environment practitioners and the consequent improvement of conservation awareness must rest on a keystone to which both conservation idealists as well as built environment pragmatists can relate. The perusal of conservation-relevant literature (Cameron, 2006; Gibson & Pendlebury, 2009; Hall & McArthur, 1996; Kerr, 2000; Lowenthal, 1985; Throsby, 2001) as well as findings from the interviews,
where all respondents spoke of values (p. 156), and the experience of teaching building conservation to property development students (p. 146) all fortified the belief that the discourse over heritage values, be they cultural or economic, should be that keystone. Through the complexities and omnipresence of the values debate each stakeholder may find a pathway into the heritage discourse through a particular aspect which is of relevance to him/her. In other words, values should be the initial point of entry to the heritage discourse, through which other aspects such as conservation philosophy and/or traditional construction may be gradually opened up and developed. Along similar lines of universal accessibility, six out of ten interview respondents called for any conservation education programme to be flexible and adaptive in order to suit the wide variety of professions included in the built environment sector. The Conservation Game should thus consider both the practical orientation of most built environment professionals as well as the theoretic background and philosophy considerations necessary for a full understanding and consequent appreciation of architectural conservation.

BUILDING CONSERVATION – a highly specialised professional domain

In 2010, the UK government issued a Statement on the Historic Environment for England which outlined the aspiration ‘that the value of the historic environment is recognised by all who have the power to shape it’ (DCMS, 2010, p. 1). This declarative is in all likelihood derived from the 1993 ICOMOS Guidelines for Education and Training in the Conservation of Monuments, Ensembles and Sites, which states in paragraph six that ‘there is a need to impart knowledge of conservation attitudes and approaches to all those who may have a direct or indirect impact on cultural property’ (ICOMOS, 1993). In the light of these statements, and taking into consideration that in a country with as high a density of protected historic buildings as the UK any built environment professional willingly or unwillingly nevertheless very much has the power to shape this historic environment, one would expect building conservation to have a strong presence in formal built environment education. Indeed, paragraph 11 of the above ICOMOS education guidelines, outlines that ‘education and sensitization for conservation
should begin in schools and continue in universities and beyond. These institutions have an important role in raising visual and cultural awareness’. Controversially, UK higher education does not frequently take up the banner of conservation, particularly at undergraduate level, as evident from the results in Chapter 4 (one in six courses, see inventory p. 116).

The investigation of building conservation education practices revealed a distinct lack of conservation grassroots sensitisation in the sense of targeting professionals beyond those who are self-motivated to acquire conservation expertise. Apart from the previously discussed infrequent and inconsistent conservation education efforts as part of general built environment degrees, less than 10% of all specialist building conservation courses on offer are directed at the undergraduate level (Figure 17, p. 106). Further, two thirds of all specialist conservation courses listed in section 4.2.2 focus on specific aspects of architectural conservation, many of them craft skills, instead of giving a broader introduction to the topic (p. 105). As such, one would already require previous conservation knowledge or be faced with a specific problem in order for these courses to be relevant. This in turn is hardly in keeping with calls for widespread and general sensitisation. The author holds the opinion that professional conservation education (as a national or organisational strategy) should not prioritise the postgraduate level and continuing professional development but should rather reach out to all aspiring built environment practitioners at the widest possible level in higher education – the undergraduate level. The author recognises the validity of early age awareness-building as championed by English Heritage (as discussed in one interview, see p. 161) as well as the need for aspect-specific conservation training for professionals, but disagrees entirely with excluding young adults (and here particularly built environment students) from this equation. Such strategic oversights must be considered reckless when the industry is seeking more conservation specialists and two thirds of professionals working with the historic environment claim that ‘their formal education in their original discipline did not prepare them adequately for working on pre-1919 projects’ (NHTG, 2008, p. 66).
Thus, current building conservation education is somewhat disconnected from the government’s, and indeed even English Heritage’s mission statements, just as conservation is disconnected from education on a departmental level in both EH and RICS. If one considers official conservation rhetoric calling for more specialist on the one hand, and actual conservation education practice on the other, one develops the impression that specialism is largely focused on creating more specialism. It almost seems as if conservation specialists are enjoying their position as supreme authority on all matters historic and are reluctant to relinquish some of their powers to less qualified individuals. This may result in built environment practitioners knowing and even speaking about conservation but lacking (or being denied) true understanding of the philosophical and theoretical background and motifs of the conservation movement, as for example previously deduced from the use of the term nostalgia (p. 156).

In this light, the author very much supports the creation of what one interviewee termed conservation paraprofessionals. These built environment practitioners would be like nurses: one would not trust them with cardio surgery (the metaphorical equivalent to works on a Grade I listed building), but they are adequately qualified to carry out a large part of the patient care on a day-to-day basis - additionally, they are also aware of the necessity to involve specialists whenever the care demands exceed their own knowledge and skill capacities. In many ways, decaying sensitive historic buildings can be likened to ailing patients, and interested built environment practitioners with a modicum of building conservation understanding could provide much of their care effectively without draining the limited resource that are conservation specialists. The proposed Conservation Game, although not designed to produce fully fledged paraprofessionals, nevertheless could raise the profile of conservation work among general built environment students, increase awareness and understanding for conservation and potentially improve recruitment into the elite circle of conservation specialists.
COMPARTMENTALISATION

One aspect became particularly evident during this investigation, and it is to this aspect that the author attributes much of the shortcomings of building conservation education. The built environment sector suffers from a large degree of professional compartmentalisation and its consequent pigeonholing of tasks, misunderstandings and miscommunication, as evident for example from the discrepancy between the number of conservation units reported on the institution websites and the survey results (p. 124 & p. 165). In other words, one can observe a tendency towards dividing built environment professionals into many neatly defined, distinct specialist professional groups bordering on but not necessarily overlapping with each other. These professions are presented, and more problematically, taught, as autonomous practices as if independent of each other in utter disregard of the multidisciplinary nature of the built environment sector.

As higher education is in some ways a mirror of the industry, this compartmentalisation is equally evident in the way courses are presented and taught. The course inventory in section 4.2.3 (p. 107 & Appendix B) revealed a wide array of courses and course subjects, the classification of which proved difficult due to large variations in nomenclature even among courses with comparable subjects and foci and the above discrepancy between website information and survey results. Along similar lines, a number of interview respondents (most notably educationalists) lamented the fact that students are being asked to study individual trees close-up, often without being given the ability to see the proverbial forest (p. 161). Here the differentiation between training and education becomes obvious and illustrates another interviewee’s point that higher education currently favours the former over the latter. While it is necessary for higher education to provide students with a solid grounding in the skills and knowledge required by their chosen career path, the author believes that higher education should, true to its name, be a place of true education – the exploration of the why alongside the knowledge of the how. This aspiration is also widely reflected in the literature (Abudi, 2010; Chapman, 2009; Jones, 1995; Klostermann, 2011; Newton, 2009).
Together with the regularly stated built environment sector’s focus on new-builds and construction (as discussed in the context of survey question 2, p. 128, and the interview reference to brown field sites, p. 158), this compartmentalisation of jobs may in part be responsible for the relative isolation of building conservation as outlined in the previous section, and the consequent perception of its irrelevance to other professional practices in the built environment. The ensuing previously mentioned tendency towards a pigeonholing of tasks in the sense of ‘this is my task, this is what I do, I need not concern myself with anything else’ is inadequately suited to producing the flexible, open-minded professionals with managerial potential called for by various reports (Bailey, 2005; Reich, 1991; Rogers, 1999). Successful 21st century education must strive to broaden a student’s horizon instead of harnessing him/her into predefined role from the moment he/she sets foot in higher education. The Conservation Game, while in the long term expected to be beneficial to the protection and high-quality management of the historic environment, at the same time aims precisely at such a broadening of horizons, a trait future professionals could profit from immensely in their careers.

It is difficult to say what caused this fragmentation of the sector. It is perhaps a product of the development towards competency-oriented skills transfer (Chapter 2, p. 42) in combination with a somewhat outdated structural model for departmentalised businesses and organisations where every aspect of working life is neatly stowed in its own private cupboard. In any case, such an approach – in the industry, but particularly in higher education – is hardly in keeping with what has become commonly known as the information age. The American comedian Mark Gungor (2009) describes the difference between a man’s brain and a woman’s brain in the way they process information: in a man’s brain, every aspect of life is stowed in a separate box (the car, the kids, the wife), and ‘the rule is, the boxes don’t touch!’ Only one box may be dealt with at a time. In a woman’s brain, every aspect is connected to every other aspect at all times in a large ball of wire. Without playing on feminist ideology, this example provides a humorous metaphor for the above sector compartmentalisation. As digital technology is affording us ever more
sophisticated ways of communication, it may be time for the built environment sector to become more like a woman’s brain, and for higher education to embrace a more holistic knowledge transfer strategy. It is somewhat disappointing that a decade after Bailey reported significant skills shortages in graduates due to a lack of holistic education, very little seems to have changed.

**AWARENESS**

Awareness, not in the metaphysical sense of *being aware* but rather as the consciousness and principle understanding of an event or pattern, was perhaps the most frequently-used term relating to knowledge building in architectural conservation over the duration of this research - all interview participants referred to it (p. 157). As with any form of cognitive understanding, there are different levels to awareness ranging from the mere acknowledgement of the existence of a phenomenon to the keen interest of an enthusiast. It is thus difficult to pinpoint what exactly a person means when speaking about awareness. In the context of conservation awareness in and for built environment students and practitioners, this thesis adopts the stance that an “acceptable” level of awareness for said practitioners could be roughly oriented on the midway point between acknowledgement and enthusiasm. It is not the aim of this thesis or the proposed Conservation Game to convert all built environment professionals to fevered conservationists, as progress and diversity of opinion are just as essential for the built environment as they are for all aspects of social life. The thesis rather aims at fertilising the intellectual built environment soil so that any seeds of conservation interest sown may find a favourable environment in which to grow.

When speaking about built environment professionals and building conservation skills and knowledge, the term awareness was frequently mentioned in the research process in connection with or rather in contrast to hard skills (as in the application of specialised knowledge). Especially during the interviews, participants voiced the view that while a general conservation awareness in the sense of the previously discussed broadening of horizons would be beneficial to all built environment
professionals, not all students/practitioners would be able to profit from hard conservation skills as only a handful of employers actively seek practitioners with conservation skills and knowledge. However, while hard skills may not be sought after, the ability to discern when specialists need to be involved (p. 169) may serve young practitioners well in their professional environment and at the same time benefit the historic built environment.

It further became evident in the teaching of a building conservation unit that it was nigh on impossible to impart students with concrete detailed knowledge about a subject entirely new to them in the space of what accumulated to 24 hours face time (as stated on p. 146). Despite the fact that such a unit is realistically the most in-depth discussion of building conservation concepts possible in the limited amount of tuition time available in a built environment course, one can hardly expect to dip much below the surface on most aspects and issues. It is thus in the students’ interest to focus (as indeed proposed by the Conservation Game) on conveying the essence of a subject, its background and relevance to their respective professional field in a condensed and meaningful way in order to grow awareness and subsequent appreciation rather than asking for specific details.

**RELEVANT EXPERIENCE**

During this research process, a widespread support for experiential learning in built environment education was confirmed which largely mirrors the aspirations for practice-oriented, relevant and contextual experience learning set out in the literature (Dewey, 1915/1938; Kolb, 1984; Mathewson, 1999; Peck & Dorricott, 1994). Built environment degrees are increasingly adopting an optional fourth year of study which is to be spent as an internship in professional practice, building on learning through experience and pedagogical praxis (Shaffer, 2004b). The survey revealed case studies and site visits, forms of practical learning, to be among the most popular and common teaching methods for building conservation education, and one interviewee argued for praxis-oriented, context-relevant learning through experience to be the correct way to learn about processes in the historic
environment (p. 148). Observations from direct teaching practice (section 4.4.5) confirmed that students appreciate relevant and contextual exercises and (despite initial hesitation) show increased engagement and motivation when asked to actively participate in the learning experience, particularly in the role play.

These observations by and large mirrored the author’s experience with two other educational role play scenarios the author visited and witnessed in the early stages of the research process. One of these scenarios was aimed at young visitors of the Royal Marines Museum in Portsmouth, where children were dressed up as soldiers, grouped into a small platoon and given roles to fulfil in a “patrol” through enemy territory (the museum) in order to track down and capture the “enemy” (a member of staff). Within minutes, even initially hesitant children had adapted eagerly to their role and were calling each other by (imaginary) rank rather than name, culminating in the spectacular capture of the enemy. The learning involved in this exercise derives from a safe and unthreatening experience of the duties of Royal Marines in hostile territories. While this role play scenario is first and foremost designed to be a lot of fun and the extent of measurable learning is consciously subordinate to that, it nevertheless demonstrates the vast motivational capacity of role plays through the sheer joy, excitement and engagement observed in a group of children.

The second role play scenario took place in a much more formal setting as part of the final year of the Computer Games Enterprise undergraduate course at Portsmouth University. In this unit called Game Developer, students were assuming the role of video game developers in a weekly combination of lecture and role play over the course of a semester. The students were asked to prepare development plans for a new game and make decisions on budgets and staff of a small, imaginary games company. During their role play sessions they were then, week after week, confronted with newly occurred “problems” playing havoc with their development schedule and budgeting. The problems, such as a day-long power outage, hardware malfunction or temporary staff shortage et cetera were presented by the lecturer
and were designed to have no straightforward solution. Students were thus engaged to think creatively and flexibly about problem-solving, which in combination with the discussion of possible courses of action in class and direct feedback from peers and lecturer encouraged critical reflection and creative solutions.

Though very different in their approaches, settings and learning provision strategies, both role plays were described to the author as highly popular and effective in informal conversations with the respective organisers after the role plays. Role plays generally rank among the most commonly used forms of interactive, experiential learning and are well popularised in the literature (Alden, 1999; Coutre, 1999; Ladousse, 1987; Lean et al., 2006; Oberle, 2004; Sleigh, 2004). The author’s teaching experience confirmed that role play can improve student motivation and enhance their understanding of a subject, but that for true learning to take place, the engagement with the subject must continue over a period of some time and be coupled with effective feedback and reflection (p. 146). Despite its attractions, role play is after all no magic wand for general student improvement but must, like any other teaching tool, be evaluated in terms of its strengths and weaknesses and implemented accordingly.

The widespread endorsement of experiential learning and the success of role plays in educational settings nevertheless validate Shaffer’s concept of educational, Epistemic Games and the proposal to adapt such learning environments for building conservation education purposes. The author firmly believes that realistic, relevant and engaging interactive experiences possess great power to influence perceptions and attitudes, for example through the engineering of cognitive dissonance (Edwards & Knight, 2006), which will be discussed in more detail in Chapter 6.
PROFESSIONAL ACCREDITATION

This research also studied the significance and impact of professional accreditation on built environment courses and the delivery of building conservation education. The importance of professional accreditation for a course is widely recognised as it renders said course more desirable for prospective students through direct links with influential professional bodies (such as the RICS or CIOB), the membership of which is generally regarded as a mark of distinction. Graduating from an accredited course facilitates the entry into these bodies, as confirmed during interviews. These bodies' national and international reputation rests on the prowess and quality of their members, and as such, accrediting bodies are reported to take a keen interest in the curricula of those higher education programmes endorsed by them, as almost half the responses to survey question 3 (p. 129) agree. Professional accreditation thus acts as a form of quality control, restricting access to degrees through high entry requirements (Figure 22, p. 116) and exerting strong influence on the subjects covered in a course.

This strong influence, which during the interviews with educationalists was at times described as restrictively prescriptive, may indirectly be part-responsible for the lack of dedicated building conservation education in built environment programmes. The requirements of professional accreditation may impose such a tight schedule that a more peripheral topic such as conservation may simply not fit in, particularly as a dedicated unit or seminar. A difficulty of balancing learning outcomes at programme level (one in 2.5 responses) and inflexible curricula (one in three) had been stated most impeding in the introduction of conservation contents to built environment courses (question 5, p. 131). The restrictiveness of professional accreditation could explain this result, seeing as almost 70% of all built environment courses in the UK (as of 2011) are accredited by at least one professional body. Additionally, of the 20 responses to one of either learning outcome balance or inflexible curriculum (or both) in question 5, only three respective courses are not accredited (15%), underlining the relative influence of professional accreditation on course contents and building conservation contents in particular.
As an example, one may investigate the membership (or chartership) application process of the RICS, which, being responsible for almost two thirds of all course accreditations, serves as a prominent sector representative. Building conservation does not list among the 22 professional RICS pathways, which is accepted and understandable due to its general surveying focus. The ability to perform to RICS standards within one of these professional pathways is measured against a combination of general competencies mandatory for all (aspiring) members, core competencies central to the respective pathway, and optional competencies to be chosen, albeit with restrictions, from a list of 85 technical proficiencies (as outlined in the 2006 RICS guide on the Assessment of Professional Competence). ’Conservation and Restoration’ is listed as item T012 in the above register of technical competencies. However, only practitioners from three out of 22 pathways (Arts and Antiques, Building Control and Building Surveying) have the option to select Conservation and Restoration as one of their optional competencies. This may serve as an explanation why a large part of courses with building conservation units (nine out of 24 as identified in the inventory and nine out of 19 in the survey) are Building Surveying degrees, while conservation is seen as less relevant in other areas due to above restrictions in the chartership application process.

The reason why building conservation education is not actively encouraged by accrediting bodies may again be found in a perception of no or little relevance to the respective professional practice, which was named the third most prominent obstacle to including building conservation contents in question 5 (p. 131). This in turn has previously be discussed as a result of insufficient communication of conservation issues and a controversial image. It will thus be particularly important for the Conservation Game development to seek endorsement and ideally cooperation from and with these professional bodies. The pragmatist built environment sector must be convinced alongside course leaders of the value of the Conservation Game and its employment in formal professional education for the game to be publicised favourably.
6  -  A CONSERVATION GAME

6.1 Introduction

The proposal to develop a digital conservation game to supplement built environment education at the tertiary level has been a key component and driving force of this research since the beginning. A large part of this thesis has so far been devoted to the discussion of relevant concepts, issues and theories as evident both from the perusal of academic background literature and the investigation into building conservation education practices in built environment HE (as copiously outlined in Chapter 4). This chapter builds on the insights gained from said research in describing the nature, structure and development implications of the proposed Conservation Game.

As detailed further in section 6.3 (p. 202), the Conservation Game is envisioned as an adapted version of Shaffer’s Epistemic Games and as such centres on the concept of a professional practicum or internship and the type of learning which occurs in such an environment through direct experience, mentor feedback and reflection. Duerden and Witt (2010) report the value of direct (hands-on) experience for deep learning in conjunction with and over indirect (lecture-based) experiences. Their focus lies on environmental education programmes, which despite revolving around the natural instead of the built environment nevertheless are significantly related to building conservation education programmes in their aim to foster (environmentally) responsible behaviour and a desire to conserve for future generations.

Duerden and Witt (2010) distinguish between affective learning, which focuses on values and attitudes, and cognitive learning, which builds skills and knowledge (p. 380). Previous research (Millar & Millar, 1996) has suggested that indirect experiences favour cognitive learning and cognitive-based attitudes, while direct experiences are superior in promoting affective learning. The notions of awareness
and values are key considerations for the Conservation Game, and as such affective learning through direct experiences is a highly relevant consideration for the game development. For want of feasible physical alternatives, the author rates the digital simulation of a conservation practicum as a direct experience. Duerden and Witt confirm Millar and Millar's findings and suggest that the emotional dimension of direct experience is a powerful intrinsic motivator and in conjunction with a preparative build-up of relevant knowledge is 'an effective method of promoting pro-environmental behaviour' (2010, p. 391). The CG should therefore encourage pro-conservation attitudes and consequent behaviour through a combination of direct experience, emotional involvement and the impartation of key concepts through meaningful interaction and repetition.

Part simulation, part strategy game, the CG is proposed as a fully digital, self-assessing, narrative-led resource management game with multiplayer capacities aimed mainly at second-year built environment students in UK undergraduate programmes. Second year offers the advantages of students having already gained a fairly comprehensive understanding of the requirements of their profession and the built environment sector while not yet being burdened with the work load and results pressure of the final year. The game should replicate the direct experience of a conservation novice learning about the dimensions and requirements of architectural conservation "on the job" as closely as possible within the constraints of a digital environment. The game will feature elements of research, evaluation, planning, negotiation and execution of plans (in short, project management tasks) in practice-relevant scenarios of conservation and heritage-led regeneration projects. These projects should be designed not only to mimic realistic scenarios but also be tailored to the needs of general built environment students/practitioners rather than conservationists in order to maximise the relevance of the experience for the intended target audience. In increasing stages of difficulty, the player will be introduced to conservation concepts, principles and processes through interaction with stakeholders and "experts" and immediate feedback on the quality and validity of actions integrated into the game-play provided by the software itself. Thus, the
CG should impart conservation understanding and appreciation as well as basic conservation knowledge and project management skills. The software should function as a professionally endorsed (RICS, EH, etc.) standalone programme which may be adopted by HEIs without the need for excessive teacher training (see section 6.3 for more details).

As this thesis represents merely the first step in what has to be anticipated as a complex Conservation Game planning and development process during which new insights may and indeed will be gained and plans adjusted accordingly, it is not the purpose of this document to provide carefully crafted instructions for the final product. Chapter 6 rather aims at outlining the first rough backbone of a possible content delivery and game development strategy as judged most appropriate in the specific context of building conservation education in built environment HE based on the results of this research and the author’s experience.

The following sections outline relevant background theory (6.2) supplementing the concepts presented and discussed in Chapter 2 as well as external requirements and professional standards and the proposed educational aims and learning outcomes. Section 6.3 (p. 201) describes the mechanics, game play dynamics and learning and assessment considerations of the Conservation Game, while section 6.4 (p. 227) briefly discusses implications for development and release. In regards to terminology, the Conservation Game and any supporting structures and resources are described as a delivery system in this chapter.

### 6.2 Game - Theory & Background

Much of the background theory concerning the conservationist, educational and game-based learning and epistemic game aspects have already been discussed in Chapter 2 and although reference to said concepts is made throughout Chapter 6, they will as such not be repeated here in any great detail. Instead, this section
briefly explores a number of psychological concepts also relevant to the proposal and development of the Conservation Game.

6.2.1 ATTITUDES AND BEHAVIOUR

As stated on several occasions throughout this thesis, the Conservation Game is conceived to be a tool for building awareness for conservation backgrounds and issues and creating basic conservation understanding and management skills in built environment students. As such, it is related not only to educational and game design principles but also to the psychological concepts of attitudes and behaviour, and more widely, attitude and behaviour change. Awareness (which has been discussed as a main aim of the Conservation Game) alone does not necessarily influence behaviour, whereas attitudes certainly impact decision-making and subsequent actions as for example described in the Theory of Planned Behaviour\(^{36}\) (TPB). In other words, while a person may be aware of building conservation issues, he or she may harbour a negative disposition towards the concept and may thus choose to act in a manner opposing the protection of the historic environment. In order to be of long-term benefit to the historic environment, the Conservation Game must not only increase understanding of architectural and heritage conservation but influence attitudes towards the same in a positive way.

Petty, Wegener and Fabrigar review a considerable body of literature on attitudes and attitude change and conclude that ‘attitudes are commonly viewed as summary evaluations of objects (e.g. oneself, other people, issues, etc) along a dimension ranging from positive to negative’ (1997, p. 611). Attitudes have been shown to develop without evidential reason and are thus difficult to fathom (Krosnick, Betz, Jussim & Lynn, 1992), the study of which having occupied the academic community for the best part of a century.

\(^{36}\) The Theory of Planned Behaviour (Ajzen, 1991) states that behaviour is preceded by the intention to perform the same and originates in a combination of personal beliefs, perceived social norms and perceived factors which impose behavioural constraints;
An attempt to change attitudes should build on an evaluation of existing attitudes in order to formulate a concrete strategy (Ajzen, 1991; Edwards & Knight, 2006). The study of students' attitudes towards building conservation was not part of this research per se. However, strength of attitudes can vary considerably, and the author's experience in higher education suggests that students rarely develop well-formed opinions of topics not directly pertaining to their field of study. As such, the average built environment student is not expected to exhibit a particularly strong affinity or aversion to building conservation as a concept while still physically removed from professional practice. At best, one may encounter mildly favourable attitudes, although without having been exposed to neither conservation education nor practice in many cases (as suggested by the data in Chapter 4), the majority of built environment students are expected to be largely indifferent to the concept of architectural conservation. However, the results from Chapter 4, particularly in terms of image and perception of relevance, also lead to the assumption that if attitudes towards conservation have indeed formed rudimentarily during higher education, they may (based on the influence exerted by teachers) tend to be negatively charged. Therefore, the Conservation Game structure as presented here builds on the assumed basis of neutral to mildly negative attitudes towards building conservation; more research in this direction is recommended prior to the development of the actual game.

Due to the presumption of encountering largely rudimentarily formed attitudes at higher education level, the Conservation Game is primarily concerned with instigating positive attitude and consequent positive behaviour towards architectural conservation rather than changing pre-existing attitudes and behaviour. Nevertheless, as the CG may also find application as a CPD programme for existing built environment practitioners, principles of behaviour change must be borne in mind during development. As such, the CG must consider various routes to persuasion such as positive associations, which can help condition attitudes favourably towards a specified topic (Krosnick et al, 1992). Terminology such as persuasion and conditioning carries negative associations with manipulation and
involuntaryness. The Conservation Game however is not about training players to react in a certain manner to predefined cues. The CG rather seeks to expose the player to a digital environment where architectural conservation is viewed in a positive light and where pro-conservation behaviour is rewarded without losing the bigger, critical picture of building conservation as a small (albeit significant) part of the built environment sector. Due to the previously discussed density of historic structures in the UK, and evidenced by the fact that every interview respondent in section 4.5 had worked on at least one conservation-related project over the course of their career (p. 158), a positive attitude towards architectural conservation can only be beneficial to young practitioners.

**Routes to Persuasion**

When dealing with complex information, one must choose which information to examine in detail, which to consider peripherally and which to ignore (Chaiken, 1980). For persuasion, this means that information should either be presented via a central route, where information is diligently considered, or via a peripheral route, where information is absorbed less through its content than through secondary cues such as attractiveness or credibility. Topics which are highly relevant to a person are traditionally processed via the central route, whereas topics of low personal relevance tend to be assessed peripherally (Cacioppo, Petty, Kao & Rodriguez, 1986). The central route to persuasion requires the attention of the intended recipient and a number of strong arguments presented in a concise and accurate fashion. People perceptive to the peripheral route respond well to the attractiveness of a message, the perceived credibility and/or expertise of the information-provider, particularly if backed up through statistics (Petty & Cacioppo, 1984). While the Conservation Game builds largely on the assumption that architectural conservation is of low personal relevance to a majority of players, one cannot predict the exact predispositions of every player. Thus, a combination of both routes is recommended for the CG (see also: Edwards & Knight, 2006).
EMOTIONAL APPEALS

As discussed in Chapter 2 and as evident from some of the interview responses in Chapter 4, heritage conservation is a topic which commonly elicits emotional response from involved stakeholders. As such, the use of emotional appeals as a way to (subliminally) influence attitudes and beliefs should be considered for the Conservation Game. Emotional appeals are commonly employed in advertising or campaigning in order to elicit a particular response in association with a product or message (Biener, Ji, Giplin & Albers, 2004; Smith & Mackie, 1995). Overall, the use of emotional appeals in the Conservation Game is considered at this point but will require further discussion during the development process as the interviews demonstrated that the emotional factor in heritage conservation is frequently viewed in a negative light by built environment practitioners - in other words, the emotional involvement of stakeholders (which naturally supports conservation) may be seen as an obstacle to redevelopment and progress. Nevertheless, the value of emotional aspects as a supplement to rational argumentation is stressed by Fox and Amichai-Hamburger (2001), and is undoubtedly important in the development of attitudes.

GROUP MEMBERSHIP

Being a member of a group promotes feelings of identity and connectedness, validating one's own place in various aspects of society. Group membership is relevant for behaviour as within a group the values and attitudes of individuals are amalgamated into social norms, thus creating a structure against which individual behaviour can be evaluated (Smith & Mackie, 1995). Behaviour which is referenced from the actions of an associated group has a tendency to influence individual future behaviour and self-identity (Eagly, 1987). Thus, the membership of a group may have a significant impact on the views and behaviour of an individual as said individual observes and strives to emulate endorsed group behaviour. As such, this psychology perspective is comparable to the concept of communities of practice which in turn have been identified as a valuable construct for use in the
Conservation Game. Simulating conservation practice, the CG may not only introduce the player to the rules and epistemology of a certain community of practice (in this case, conservationists), but may also promote the creation and membership of a new group, the conservation paraprofessional.

In terms of group membership, the Conservation Game may also reinforce the reality of a multidisciplinary, multi-stakeholder built environment practice which necessitates cooperative (i.e. group) work due to its complexity.

**COGNITIVE DISSONANCE**

Another well-publicised way of influencing attitudes and associated behaviour rests on the concept of cognitive dissonance. First presented by Leon Festinger in 1957, cognitive dissonance describes how ‘the perception of an inconsistency among an individual’s cognitions generates a negative intrapersonal state (dissonance), which motivates an individual to seek and implement a strategy to alleviate this aversive state’ (Elliot & Devine, 1994, p. 382). In other words, if an individual’s actions are inconsistent with his/her personal attitudes or convictions (self-standards), the individual experiences psychological discomfort. This discomfort, described as dissonance, motivates the individual to find ways to correct this state, which is generally achieved through either a change of behaviour or the adaptation of personal attitudes (Cooper & Fazio, 4). Similarly, a person may be motivated to change his/her attitude if encouraged to act in a counterintuitive way through the desire to counter the effects of arising cognitive dissonance (Stone & Cooper, 2001). A small change in behaviour predispositions an individual towards a larger change in behaviour in the future (Edwards & Knight, 2006). Thus, if a player who is negatively predispositioned towards architectural conservation is gently encouraged to act like a conservationist, and contrary to expectations finds him/herself enjoying the process, attitudes and consequent behaviour towards conservation may be positively influenced in the long term.

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However, research has shown that inconsistencies between attitudes and various forms of behaviour can occur without arousing dissonance. For dissonance to arise, a person must be conscious of the discrepant nature of his/her actions (Thøgersen, 2003). Therefore, attempts to instigate behaviour change based on cognitive dissonance will not bear fruit with individuals (players) whose attitudes towards conservation are neutral or favourable. Thus, all of the above mentioned ways of influencing attitudes and behaviour should be considered in the development of the Conservation Game to cater for as wide a base of player predispositions as possible (taking into consideration that individuals who choose to play the CG will be unlikely to exhibit ultra-averse attitudes towards conservation, thus not warranting special preparation for such cases).

6.2.2 EXTERNAL STANDARDS & REQUIREMENTS

In order for the Conservation Game (CG) to be recognised by the higher education community, it must demonstrate to represent a standard of quality comparable to that of other built environment units at UK undergraduate level. In addition, seeking endorsement by leading professional bodies from the sector, notably English Heritage, the RICS and CIOB, has been expressly recommended for the CG during the interview stage. This section briefly explores the quality considerations relevant for the development of a CG.

NATIONAL ACADEMIC STANDARDS

In the UK, the Quality Assurance Agency for Higher Education (QAA) is widely responsible for the outline and upkeep of academic standards through a combination of guidance, support, supervision and review of higher education institutions. As of 2012, the QAA is heavily involved in developing a new UK Quality Code for HE (consulting began in December 2011) in cooperation with the HE sector (Quality Assurance Agency, n.d.). This comprehensive document supersedes and partly integrates the set of national quality reference points known as the Academic Infrastructure from 2012/13. The new Quality Code comprises of three parts (A:
Setting and maintaining threshold academic standards; B: Assuring and enhancing academic quality; and C: Information about higher education provision), of which part B has been judged as most relevant to the development of a high-quality Conservation Game. Aside from covering traditional higher education instruction, part B also makes (separate) provisions for what is termed flexible and distributed learning (Chapter B3, section 1), including distance- and e-learning programmes, and work-based/placement learning (B3-2). In relation to the Code, the Conservation Game is unique in that it has to be regarded as a hybrid of both these approaches through the combination of pedagogical praxis with a digital learning environment.

Within the Code, targeted best practice approaches are outlined in a series of quality indicators by which to judge a higher education institution or study programme. By and large, these indicators concern full programmes and even whole subject groups and are as such somewhat too broadly defined to be specifically applicable to the CG. Below, the author presents a proposed selection of applicable general principles adapted and developed from the Quality Code (QAA, 2011) specifically as a development basis for the Conservation Game (CG-relevant aspects and implications marked with a circle [o]):

- the quality criteria of traditionally taught programmes should whenever possible or feasible also apply to flexible and distributed learning programmes, including digital (e-learning) approaches
- students should be able to have confidence in the validity of their achieved award within their chosen professional environment and career path
- students should have equal and easy access to relevant support structures within a higher education institution (or, in the case of the CG, subject area)
  - due to the CG being designed as a national programme, support should be web-based and centralised
- institutions should provide a comprehensive service for career guidance
to that effect, institutions should operate a tight network with relevant industry stakeholders

to that effect, institutions should further be aware of global trends and developments
  o in order to promote a more holistic approach to built environment education, information on careers in conservation should be included

students on courses (or, in the case of the CG, modules or units) should have access to all relevant course/module/unit documentation, including:
  ▪ course/module/unit description
  ▪ comprehensive list of learning outcomes
  ▪ course/module/unit requirements
  ▪ type and nature of assessment
  ▪ type and nature of award

all work which aspires to be formally recognised must be appropriately and formally assessed
  o to that effect, any assessment structure within the CG must be solid, comprehensible and replicable and provide an accurate measurement of learning progress

assessment of work or achievements outside of institutions such as on placement must be overseen by a suitably qualified person and all workplace learning should be monitored by the awarding HEI
  o in the case of the CG, the game itself must take the place of suitably qualified assessor (see also: section 6.3.3 on assessment, p. 224)

all assessment must be fair, transparent and decisions should be communicated to students in a comprehensible and timely fashion in order to promote improvement

institutions should encourage assessment practices which promote effective learning through feedback and reflection
institutions should encourage the use of feedback loops over the duration of a course/module/unit which allow a student to monitor performance

- constant, instant and relevant feedback for performance monitoring is a cornerstone of effective game play as well as learning, particularly in pedagogical praxis, and should as such be implemented in the CG

Next to the Quality Code, the development of the Conservation Game should also consider the more built-environment specific QAA benchmark statement for Construction, Property and Surveying (2008). While not acknowledging conservation as part of the above professional circles, this document nevertheless outlines the quality criteria for built environment professional education on a general level and should therefore be taken into consideration.

PROFESSIONAL STANDARDS

As the most prominent accreditation body in the built environment sector, accounting for almost two thirds of all accreditations as discussed in the context of the course inventories in section 4.2.3 (p. 111), the Royal Institution of Chartered Surveyors (RICS) is a key player in both industry and education. As such, their accreditation and membership criteria are of value to the development process of the Conservation Game. The Chartered Institute of Building (CIOB) also accounts for many course accreditations in the built environment education sector, yet as their central focus lies on new builds rather than evaluation, the author does not consider their accreditation standards relevant enough to be of influence to the Conservation Game. Nevertheless, CIOB representatives should be contacted and embedded in the game development phase to ensure a broad support base and widespread applicability of the Conservation Game.

The RICS acknowledges the importance of architectural conservation in the context of the three strands of sustainable development (social, economic and
environmental) as evident from the work of the RICS Building Conservation Forum and confirmed in the interview process. Away from the Conservation Forum, which is an amalgamation of conservation specialists, the RICS's commitment to conservation is far more nominal. As previously discussed in Chapter 5 (p. 176), 'Conservation and Restoration' is listed as one of the 85 optional technical competencies recognised by the RICS, yet only practitioners from three pathways may reasonably select this competency if it is to be counted towards RICS membership. In addition, the description of technical competency T012 - Conservation and Restoration in the (2006) RICS guide to Assessment of Professional Competence (a key document informing prospective applicants about the requirements of chartership) is short and extremely vague. Instead, the more comprehensive RICS UK Practice Standards (Historic building conservation) (2009b), to which all members must adhere, should serve as a basis for the evaluation of the position of the RICS towards conservation.

Overall, the importance of RICS accreditation for courses and chartership for professionals is undeniable. Therefore, the Conservation Game should aspire to serve as a stepping stone towards the demonstration of competence in the chartership application process and must consequently adhere to high professional standards. As the RICS definition of building conservation competence falls somewhat short of the requirements for the development of a reputable teaching tool in this subject and RICS course accreditation criteria do not refer to building conservation at all, this thesis looks towards the practice standards set out by ICOMOS, English Heritage and the Institute of Historic Building Conservation (IHBC) for guidance. Nonetheless one should note a gentle but gradual positive trend towards greater interest in building conservation practice and cooperation exhibited by the RICS.

English Heritage does not accredit courses per se, but rather supports other organisations' (such as the RICS through the Conservation Forum) accreditations of

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38 see RICS website: http://www.rics.org/buildingconservationforum
practitioners with proven building conservation expertise under the umbrella of a pan-professional forum of accrediting bodies for conservation called the Edinburgh Group (Preston, 2006). As such, English Heritage has not issued its own concrete quality criteria for accreditation. However, their conservation education philosophy (as indeed that of the Edinburgh Group) builds on the principles outlined in the 1993 ICOMOS Guidelines for Education and Training in the Conservation of Monuments and Sites. These internationally accepted guidelines are an integral source for the development of conservation education anywhere in the world and must therefore also be considered a vital basis for the CG. Further, any UK conservation legislation has to be regarded as a form of quality benchmark developed under the supervision and influence of English Heritage.

Section 5 of the ICOMOS 1993 education and training guidelines demands that work on conservation projects should only be entrusted to practitioners possessing the specialist abilities to:

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>a.</td>
<td>Read a monument, ensemble or site and identify its emotional, cultural and use significance</td>
</tr>
<tr>
<td>b.</td>
<td>understand the history and technology of monuments, ensembles or sites in order to define their identity, plan for their conservation, and interpret the results of this research</td>
</tr>
<tr>
<td>c.</td>
<td>understand the setting of a monument, ensemble or site, their contents and surroundings, in relation to other buildings, gardens or landscapes</td>
</tr>
<tr>
<td>d.</td>
<td>find and absorb all available sources of information relevant to the monument, ensemble or site being studied</td>
</tr>
<tr>
<td>e.</td>
<td>understand and analyze the behaviour of monuments, ensembles and sites as complex systems</td>
</tr>
<tr>
<td>f.</td>
<td>diagnose intrinsic and extrinsic causes of decay as a basis for appropriate action</td>
</tr>
<tr>
<td>g.</td>
<td>inspect and make reports intelligible to non-specialist readers of monuments, ensembles or sites, illustrated by graphic means such as sketches and photographs</td>
</tr>
<tr>
<td>h.</td>
<td>know, understand and apply UNESCO conventions and recommendations, and ICOMOS and other recognized Charters, regulations and guidelines</td>
</tr>
<tr>
<td>i.</td>
<td>make balanced judgements based on shared ethical principles, and accept responsibility for the long-term welfare of cultural heritage</td>
</tr>
<tr>
<td>j.</td>
<td>recognize when advice must be sought and define the areas of need of study by different specialists, e.g. wall paintings, sculpture and objects of artistic and historical value, and/or studies of materials and systems</td>
</tr>
<tr>
<td>k.</td>
<td>give expert advice on maintenance strategies, management policies and the policy framework for environmental protection and preservation of monuments and their contents, and sites</td>
</tr>
<tr>
<td>l.</td>
<td>document works executed and make same accessible</td>
</tr>
<tr>
<td>m.</td>
<td>work in multi-disciplinary groups using sound methods</td>
</tr>
<tr>
<td>n.</td>
<td>be able to work with inhabitants, administrators and planners to resolve conflicts and to develop conservation strategies appropriate to local needs, abilities and resources</td>
</tr>
</tbody>
</table>

Table 5: list of ICOMOS competences for conservation professionals as set out in the 1993 Guidelines for Education and Training in the Conservation of Monuments, Ensembles and Sites
Similar to these guidelines (having been aligned with them), the IHBC asks membership applicants to demonstrate competence in the areas of conservation philosophy and practice, history, research and analysis, finance and economics, conservation legislation and policies as well as design evaluation and conservation technology (IHBC, 2008).

Both of the above documents presume the implementation of the outlined guides by conservation professionals and do not make provisions for conservation work carried out by less qualified individuals. In ideal circumstances, and certainly whenever an object of particular sensitivity is concerned, conservation work should indeed be left to specialists. However, as has been pointed out repeatedly in this thesis, the UK heritage sector is experiencing a shortage of specialists for architectural conservation and as such could benefit from an increased amount of paraprofessionals. As the quality standards of conservation work must be maintained regardless of the precise qualifications of the person carrying out said work, paraprofessionals should aspire to adhere to the above guides irrespective of individual accreditation status. As such, the Conservation Game in its capacity as an entryway into conservation paraprofessionalism should provide players with an experience of all of the above aspects. However, as it is aimed at conservation "beginners", it should focus specifically on those aspects concerned with conservation philosophy and practice.

The author's suggestion of suitable competences in the context of built environment professionals new to the subject of architectural conservation are reflected in the CG learning outcomes in section 6.2.3 (p. 195). The Conservation Game development is thus encouraged to summarily draw on the following professional and academic benchmark references:

- The QAA UK Quality Code for Higher Education (2011-13)
The QAA benchmark statement for Construction, Property and Surveying (2008)

The Higher Education Academy's (HEA) UK Professional Standards Framework for teaching and supporting learning in higher education (2011)


The EH Conservation Principles, Policies and Guidelines for the sustainable management of the historic environment (2008)

The RICS UK Practice Standards (Historic Building Conservation) (2008)

The IHBC Membership Standards, Criteria & Guidelines (2008)

current UK conservation legislation as presented in the National Planning Policy Framework (2012)

6.2.3 EDUCATIONAL AIMS & LEARNING OUTCOMES

The Conservation Game aims to be a nationally recognised programme for the advancement of conservation awareness and basic conservation project management skills in higher education, with endorsement from higher education institutions as well as key professional bodies in the built environment industry. As such, the Game must be structurally and pedagogically sound following a set of national and professional guidelines and be well and transparently documented. As outlined below, a simple accumulation of competency requirements from relevant conservation bodies (such as ICOMOS, EH or IHBC) is unsuitable for the CG due to their focus on specialist work. Since the Conservation Game is conceived as being an introductory tool to the subject for conservation novices, the above guidelines and requirements are too broadly defined in the sense that they ask for competencies (such as being familiar with the physical and chemical composition of traditional building materials) which cannot be acquired in a matter of hours. Neither are skills such as precise historic dating of a structure or extensive knowledge about conservation funding (i.e. grant) possibilities of direct relevance to the general built environment student.
This section therefore proposes a tailor-made set of educational aims and learning outcomes for the Conservation Game, custom-developed for the CG from the above national and professional guidelines and set out in accordance with the University of Portsmouth Programme Specifications for undergraduate built environment courses and the MSc Historic Building Conservation.

EDUCATIONAL AIMS

- To provide a systematic, coherent and balanced introduction to the domain of architectural conservation and heritage-led regeneration to complement UK undergraduate built environment education (main aim)

- To develop an understanding of the multi-faceted and interdisciplinary domain of architectural conservation

- To develop appreciation of heritage conservation work in both cultural and economic contexts

- To develop an understanding of the resources and processes employed in architectural conservation

- To develop an understanding of the built environment practitioner’s role and responsibility in the heritage conservation sector

- To provide an engaging learning environment as a foundation for a student's extension of intellectual and managerial skills and a move towards progressively independent study and (research) work in this subject
LEARNING OUTCOMES

As laid out in the University of Portsmouth Programme Specifications, the various learning outcomes for each programme are structured into four different component groups:

- Knowledge and understanding
- Cognitive (intellectual or thinking) skills
- Practical, professional or subject skills
- Transferable (graduate & employability) skills

These are academic groupings and despite featuring four similar categories do not precisely align with Shaffer’s epistemic frame concept. Epistemic frames (p. 71) consist of skills and knowledge, values, identity and epistemology, the understanding of how the former interact in any given (professional) environment. Knowledge and understanding (a) and practical, professional and subject skills (c) find their respective counterpart in the epistemic frame components, and cognitive (b) and transferable (d) skills may be aligned roughly with epistemology. The academic structuring of learning outcomes does not (officially) take into account the values and identities of a professional circle or community of practice.

As the Conservation Game must first and foremost exist in the academic context of UK higher education, and Shaffer’s epistemic frames and games are modelled to suit US education, the learning outcomes for the Conservation Game are predominantly structured after the above UK model. Nonetheless, the validity of Shaffer’s epistemic frame components is recognised in the development of the CG, which after all aspires to be an Epistemic Game. While the following learning outcomes may be structured according to UK custom, the implications of epistemic frame components including values and identity have been considered in their development.
As previously stated, the learning outcomes presented below have been specifically developed to suit the Conservation Game's aspirations of teaching conservation novices and -laypeople, based on the layout structure provided by the University of Portsmouth Programme Specifications.

Through playing the Conservation Game, students should acquire, on threshold level, some or all of the following:

### A) KNOWLEDGE AND UNDERSTANDING OF:

- the manifold reasons for heritage/architectural conservation and associated values
- general building conservation philosophy and concepts
- the concepts of character and identity in relation to buildings
- the concept of project uniqueness
- conservation approaches such as like-for-like replacement, minimal intervention, reversibility, etc.
- general building conservation practice and processes
- a historic structure's multi-layered significance
- the value of true understanding of a structure and its significance prior to project planning and work
- the relevance of a site's setting
- the unique characteristics of traditional construction and materials
- the consequences of development proposals and intervention on a historic structure
- the various impacts of dealing with conservation-sensitive structures on project planning (time/finance/effort/design)
- the importance of sustainable quality work in architectural conservation
- the main professional bodies in conservation as relevant to project work
- market behaviour related to historic/traditional buildings
- planning legislation relevant to conservation and legal liability
**B) COGNITIVE (INTELLECTUAL or THINKING) SKILLS** (the ability to):

- develop an awareness of different theoretical positions and their respective validity according to context
- critically appraise information and/or situations based on primary and secondary data from various sources
- assimilate above information and integrate it into a clearly defined argument and/or strategy
- demonstrate capacity for independent judgement through critical reasoning and creative response
- identify (personal/strategy/planning) shortcomings based on feedback and/or critical reflection and take action accordingly

**C) PRACTICAL, PROFESSIONAL and SUBJECT SKILLS** (the ability to):

- demonstrate understanding and command of specialist vocabularies used by the community of conservation professionals, and the ability to apply them in critical analysis (see section 6.2.4 below)
- accept responsibility for the long-term welfare of the historic (built) environment
- identify all stakeholders in architectural conservation projects and take into critical consideration their respective agendas
- interact and negotiate efficiently with the above
- identify archetypes of traditional construction and historic aesthetic
- identify features of value within a historic/protected building
- identify potential reasons for the decay/dereliction of a structure (physical and social)
- identify appropriate/sympathetic new uses for derelict buildings and devise a conservation-sensitive refurbishment and management strategy
- take into consideration the project planning implications (time/finance/effort/design) of working with sensitive historic structures
- evaluate design propositions in relation to a building’s character
• identify and employ suitably qualified craftspeople
• promote and enforce high-quality work on conservation projects
• recognise when advice must be sought and identify relevant sources of information

D) **TRANSFERABLE (GRADUATE and EMPLOYABILITY) SKILLS** (the ability to):

• assess problem domains and specify appropriate action
• participate in critical discussion, work in relation to others, and negotiate responses and solutions
• develop basic capacity for reflection-in-action
• work in multi-disciplinary teams
• build on previous information in order to generalise
• develop a more comprehensive understanding of cultural heritage and the built environment sector
• develop a curiosity for architectural conservation and heritage-led regeneration

Table 6 a-d: Conservation Game proposed learning outcomes

In terms of actual in-game application of learning elements, which is elaborated more generally in section 6.3 (p. 202), and the correlating achievement of learning outcomes in players, one may picture the following in-game scenario:

A player is investigating a derelict historic structure at the start of play in order to gain information on said structure on which to base further action. In addition to the player’s individual exploration of the (virtual) site, he/she will during this process communicate with a variety of concerned stakeholders (non-player characters, NPCs), who will present their views and opinions on both structure and any possible plans for the future of the same. If the player (figuratively) unearths an aspect of the structure which he/she does not understand (which can range from materials and physical items to historic references in an archive or a special relevance to a specific group of people), virtual experts and specialists may be

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consulted. Some stakeholders will be more influential than others in the game world, and the player will need to balance and negotiate their agendas within his/her own game project plans in order to achieve a satisfying end result.

During this process, the player is engaged in activities which play on aspects within each of the learning outcome categories presented in Table 6. Communication with stakeholders underlines the multi-layered significance of a building (cat. A) as well as the concepts of building character and identity. Said communication also helps the player to develop an understanding of the various value structures and theoretical backgrounds associated with both conservation object and stakeholder groups (cat. B). The necessity to negotiate the various stakeholder agendas is designed to foster learning about the valued features of a structure as well as the ability to interact and negotiate with groups and individuals (cat. C) and consider the validity of various positions in the context of critical discussion and multi-disciplinary team work (cat. D).

EMPLOYABILITY

The Conservation Game does not aim to be a purely academic exercise but rather supports the contextual and practice-relevant diversification of built environment students' skills and knowledge in order to increase what is broadly called employability. The Confederation of British Industry defines employability as ‘a set of attributes, skills and knowledge that all labour market participants should possess to ensure they have the capability of being effective in the workplace – to the benefit of themselves, their employer and the wider economy’ (CBI, 2007, p. 11). In other words, employability skills facilitate and enhance employment opportunities in an increasingly competitive graduate employment market. The University of Portsmouth Employability Strategy (2009, p. 4) outlines some 17 generic employability skills all graduates should possess. In addition to the transferable skills laid out in the above learning outcomes, the following table illustrates the Conservation Game's projected performance in addressing and enhancing generic employability skills.
Epistemic frames are characterised by a person’s ability to cognitively and physically navigate a given (professional) environment or community in a manner which is endorsed by other members of said community. A significant part of the mastery of a knowledge domain lies in the ability to understand and meaningfully utilise the domain's specific vocabulary. Evidence for this command over profession-specific phrasing and vocabulary builds the basis for the assessment of epistemic frame growth in Shaffer’s epistemic network analysis (Shaffer et al., 2009). Further, the wish for students to be sufficiently articulate is not only outlined in the University of Portsmouth Programme Specifications for undergraduate built environment courses but was also repeatedly mentioned during interviews. As such, the command of professional conservation vocabulary has been specified as a key learning outcome in the previous section. The following table lists the most commonly applied terms and phrases in the UK's architectural conservation sector (in no particular order):
<table>
<thead>
<tr>
<th>Character</th>
<th>Repair</th>
<th>Replacement</th>
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<tbody>
<tr>
<td>Reconstruction</td>
<td>Identity</td>
<td>Reversibility*</td>
</tr>
<tr>
<td>Aesthetic</td>
<td>Vulnerability/sensitivity</td>
<td>Context</td>
</tr>
<tr>
<td>Setting</td>
<td>Place</td>
<td>Purpose/use</td>
</tr>
<tr>
<td>Monument</td>
<td>Heritage</td>
<td>Site</td>
</tr>
<tr>
<td>History</td>
<td>Association</td>
<td>Significance (statement of)*</td>
</tr>
<tr>
<td>Authenticity</td>
<td>Understanding</td>
<td>(minimum) intervention</td>
</tr>
<tr>
<td>Traditional materials/construction</td>
<td>Setting</td>
<td>Vernacular</td>
</tr>
<tr>
<td>Like-for-like*</td>
<td>Pastiche*</td>
<td>Interpretation</td>
</tr>
<tr>
<td>Listing/listed</td>
<td>Consent (planning application)</td>
<td>Value (cultural &amp; economic)</td>
</tr>
<tr>
<td>Interest</td>
<td>Sympathetic</td>
<td>Conserve-as-found</td>
</tr>
<tr>
<td>(historic) fabric</td>
<td>(physical/character) erosion</td>
<td>Demolition</td>
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<tr>
<td>(cultural) responsibility</td>
<td>Appraisal/survey</td>
<td>Maintenance</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Conservation plan</td>
<td>Conservation area</td>
</tr>
<tr>
<td>Future generations</td>
<td>Records/archive</td>
<td>Neglect</td>
</tr>
<tr>
<td>Decay</td>
<td>Deterioration</td>
<td>Dereliction</td>
</tr>
<tr>
<td>Specialist (craftspeople)</td>
<td>Conservation</td>
<td>National Planning Policy Framework</td>
</tr>
<tr>
<td>English Heritage</td>
<td>Protection</td>
<td>Structure</td>
</tr>
<tr>
<td>Conservation officer</td>
<td>Preservation*</td>
<td>Custodian(ship)</td>
</tr>
</tbody>
</table>

Table 8: A conservationist’s vocabulary

Those terms marked with an asterisk are illuminated in the thesis glossary in Appendix A.
6.3 Game - Proposal

The adaptation of educational content into a digital game is generally one of three possible approaches: the re-purposing of existing, commercial games, the creation of multimedia applications with a main focus on content presentation rather than game play, and a middle category of purpose-built educational games which strive for a balance between playability and educational content (Moreno-Ger, Burgos, Martínez-Ortiz, Sierra & Fernández-Manjón, 2008).

The re-purposing of commercial games such as Civilization, SimCity, Second Life, and even online fantasy role-playing games such as World of Warcraft for educational use has become popular in recent years (Delwiche, 2006; Hostetter, 2006). However, as these games were never designed with education in mind, their application rests on their vast motivational powers rather than on explicitly educational content. On the other end of this spectrum, content-focused educational games (many of which are examples of the nowadays somewhat frowned-upon Edutainment category), often merely provide 'slightly interactive multimedia wrappers around traditional educational content' (Moreno-Ger, et al, 2008, p. 2531) and as such are frequently boring and unattractive (Papert, 1998; Van Eck, 2006). The most applicable (yet perforce the most complex and therefore costly) approach in terms of creating an engaging, enjoyable game centred on educational purposes lies in the custom-creation of such a game for any desired subject (Prensky, 2001). The following sections outline the proposed backbone for the development of such a game for building conservation education.

6.3.1 GAME OUTLINE

As previously stated, the Conservation Game is proposed as a fully digital, self-assessing, narrative-led resource management game with multiplayer capacities aimed mainly at second-year built environment students in UK undergraduate programmes. It should replicate the direct experience of a conservation novice learning about the dimensions and requirements of architectural conservation "on the job" in a digital environment. This section illustrates the proposed game type
and structure as well as considerations in regards to play modes and the integration of the CG into existing curricula.

GAME TYPE

Just as is the case with more traditional types of instruction, not every game type is equally suited to the delivery of a particular subject knowledge (Amory, Naicker, Vincent & Adams, 1999). For the purpose of creating a digital learning environment where players can explore and learn about the processes and challenges involved in architectural conservation within the imagined scenario (fantasy) of a conservation practicum, a resource management game type is the most applicable. In real terms, running a conservation project is essentially an exercise in the management of limited resources in a given set of particular circumstances. The Conservation Game as a resource management game would play on the strengths of simulations ("If I invest this much capital to take a certain action, said action will have certain repercussions on the game environment"). This close relationship with simulations makes (commercial) resource management games such as SimCity or RollerCoaster Tycoon popular games to be repurposed for educational purposes (Van Eck, 2006).

In order to increase the aspect of challenge, the author proposes to combine the classic resource management mechanics of invest and reap with the real-time event interaction of action strategy games. As further explained in section 6.3.2 (p. 223), periodic events occurring outside of player control (such as a gas leak or a new archaeological discovery on the project site) should place additional strain on resources and management capacities with their demand for timely remedial action. The principle of "events" which (temporarily or permanently) alter the configuration of the game/project scenario in order to elicit problem-solving strategies under time and resource pressure has is being successfully employed in both educational (see the Game Developer role play described on p. 174) and commercial games (see for example dynamic events in Guild Wars 2).
GAME STRUCTURE

In order to replicate a real-life relevant conservation practicum, the Conservation Game is proposed as a series of architectural conservation and heritage-led regeneration projects in levels of increasing difficulty and complexity. Players should thus experience all relevant aspects of the building conservation process from the initial evaluation and understanding of an object through to maintenance and aftercare. Figure 30 illustrates the stages in a typical conservation project cycle.

As discussed in Chapter 2 (p. 28) and stressed in the game learning outcomes, the development of a full understanding of the structure to be conserved is potentially the most essential stage in the project cycle, as it directly influences design decisions, design execution and appropriate aftercare. As such, the Conservation Game should actively encourage and reward exploration at this project stage (see section 6.3.2 for more detail). Once a structure is understood, a conservation plan (i.e. a conservation project strategy) can be drawn up detailing proposals for adaptation, new use and refurbishment/redevelopment design. These plans then have to be submitted for consultation with the local authorities and EH in order to secure planning permission. Should permission not be given or conditions imposed, the project re-enters the design stage. Upon project approval, one may begin with the execution of the proposed design. Physical work on a historic structure generally brings to light new insights into the structure and adds
to the understanding of the object - any significant new findings must be incorporated in the project plan and as such may alter the proposal at a late project state. Good conservation projects also make timely provisions for object maintenance and correct aftercare in order to secure the long-term survival of the structure.

The Conservation Game is envisioned to feature up to five differing iterations of the above project cycle to varying specifications and levels of difficulty. Figure 31 shows an extremely simplified proposed structure of the CG.

![Figure 31: Conservation Game structure overview](image)

In order to accommodate for the differing professional views on conservation within the range of professions in the built environment sector, the CG should, upon initial start-up, allow the selection of a professional group for the respective player, thus configuring the game settings to be as relevant as possible to this particular professional circle. It should be noted at this point that said profession choice will not have a significant impact on the way the game is structured or played - all players will still become conservation interns and follow similar pre-defined routes. This choice rather offers a modicum of personalisation through the use of profession-specific views and vocabulary.
Having chosen a profession, players then go through a brief tutorial, which is a form of in-game training camp to introduce a player to his role in the game, the way the game operates and how the player can interact with and influence the events in the game. This tutorial stage should be designed to feel like an integral stage of the game rather than a handbook for game controls in order not to induce boredom and frustration before play has even fully begun. The capacity of a game to introduce a player to the mechanics of play in a captivating fashion without use of a manual is regarded as a key element of successful game design (Desurvire, Caplan & Toth, 2004; Sweetser & Wyeth, 2005).

After the tutorial stage, all players will proceed to Project A, which as the first full in-game conservation project still acts as a form of tutorial, allowing a player to explore the game controls and variables and experience the impact of his/her decision-making on the game environment. As such, Project A is proposed to be the simplest project in the form of a single structure to be conserved, and decisions taken during Project A should not impact too heavily on the in-game assessment (see 6.3.3, p. 224).

Up to this point, progress in the game is structured in a linear form - all players have to undergo the tutorial stage and complete Project A. This is designed to give all players a solid understanding of the game mechanics and some introduction into the building conservation project cycle. After completing Project A, players may choose to progress to either Project B or C (or go directly into the multiplayer option - see p. 209). Both these projects are more complex than Project A, involving multiple buildings (i.e. a neighbourhood) in P. B and an entire part of a city for regeneration in P. C. These projects should challenge the player and encourage closer consideration of conservation aspects through increasing weight and impact of player decisions. In order to complete the game successfully in academic terms (again, see assessment in section 6.3.3), a player should have to complete Project A and at least one out of Projects B and C.
The game stages of Projects A, B and C are only presented as one option each in Figure 31. However, it is conceivable that more than one project option (i.e. different structures or stakeholder configurations) are designed for each project stage, so that a player may for example choose from three different versions of Project A. While this would greatly contribute to the depth and adaptability of the game, decisions such as these are conditional upon the availability of development resources and may or may not come to pass.

In its entirety as a delivery system, the Conservation Game is proposed to be supplemented with an online database, discussion platform and support structure as outlined in section 6.4 (p. 233).

CURRICULUM INTEGRATION

The Conservation Game is proposed as a nationally adoptable tool to increase conservation awareness and promote basic background and process knowledge and subsequent pro-conservation behaviour. The aim of the CG does not lie in a centralisation of baseline conservation education but rather in providing a ready-made, respectable educational delivery system which is self-sufficient enough to easily integrate into existing built environment curricula. Self-sufficiency in this context denotes a delivery system which is self-explanatory, self-guiding and self-assessing (6.3.2 & 6.3.3) in order to minimise the necessity for the presence of conservation expertise among academic staff.

Many interviewees in Chapter 4 stressed the importance for any delivery system to be flexible in order to be adaptable to the teaching styles of individual institutions and lecturers. While it is not feasible to design a game which caters individually to the requirements of every institution in the country, the Conservation Game should make certain concessions in this regard. Firstly, the adoption of the CG by an institution or course must operate on an opt-in rather than opt-out basis as to not curtail the autonomy and pedagogical liberty of HEIs. Instead, other steps should be taken to promote its uptake (see 6.4, p. 233).
Secondly, the game should be a useful addition to all current built environment programmes and as such must adapt to the requirements of different professional backgrounds. As previously mentioned, each professional group (as derived from those identified in Chapter 4 (p. 109), should have the option to select a slightly different starting point according to their professional requirements. These varying option strands should then converge on a conservation route which is similar for all professions.

While it is not in the author’s interest to prescribe the terms of its application, the Conservation Game is believed to be most suitable to students in their second year of study, having already gained a fairly comprehensive understanding of the requirements of their profession and the built environment sector while not yet being burdened with the work load and results pressure of the final year. The author proposes to implement the CG as a three to four-day block seminar, either as mandatory or optional exercise, possibly during project week. This way, the students (players) engage with the topic of building conservation and heritage-led regeneration in a concentrated fashion which is preferable to the disconnected bit-by-bit approach of a semester- or term-long unit. It allows players to "work" on a project for several hours at a time, aiding immersion and allowing the in-game scenarios to be more complex and engaging. The overall hours of play time, while not exactly specifiable due to varying play speeds, should be estimated to equate to those of a regular semester- or term-long unit (for example, a weekly two-hour lecture over the period of a semester, i.e. 12 weeks, would equal approximately 24 hours of play time). Although the overall study hours should not exceed those of a regular unit, the author anticipates higher retention rates through deeper engagement with the subject matter in the proposed concentrated form.

As an alternative to the integration of the CG into formally assessed academic structures, the author suggests the use of the game as a form of student CPD, the completion of which rests outside of the main curriculum but is accepted in
professional practice as a career stepping stone (as commonly practiced in built environment HE, particularly at postgraduate level).

PLAY MODES

As introduced in section 6.1 and briefly touched on in Figure 30 (p. 204), the Conservation Game is envisioned as a primarily single-player oriented system with multiplayer (i.e. cooperative) capacities. Although the experience of aspects of cooperation and adaptation to team dynamics are omnipresent demands on higher education, a game designed fully for inter-player cooperation is largely unsustainable in an academic environment where the focus lies on the assessment of individual performance. As such, and also in the light of a potential adaptation of the CG for CPD purposes, it is important to primarily consider the CG as a learning tool for individuals.

Nevertheless, the author believes that the CG would benefit from featuring a cooperative mode, which could trigger the sort of interpersonal motivation required to actively re-engage with a game after having played it once (Pivec, 2009). In the Conservation Game, each player should access the game environment through his/her personal computer but connect in-game with other players to work together on a project scenario in a projected group size of three to four players. Group sizes should encourage the distribution of tasks while maintaining a measure of clarity as to who is responsible for what. Instead of managing individual resources, team members should be able to draw from a joint team resource pool. As any form of cooperation must involve the coordination of delegated tasks, negotiation of resource use and discussion of joint strategies, the multiplayer option of the CG should include an effective intra-team communication tool.

The multiplayer mode should become accessible after completing the game tutorial and at least one individual game project. Due to the increased work capacity of a group compared to a single player, the multiplayer mode should only be available for the most complex project category (cat. C as outlined above, p. 204). The decision of whether or not to make use of the cooperative mode should
rest with the individual institutions in accordance with their respective teaching and assessment strategies.

6.3.2 GAME PLAY DYNAMICS - fun & meeting learning outcomes

Where the previous section was mainly concerned with a description of the proposed game structure and suggestions towards eventual curriculum integration, this section outlines a suggestion of steps to be taken in order to provide meaningful, enjoyable game play while meeting the educational aims of the Conservation Game.

Maintaining Enjoyment: Challenge, Motivation, Immersion

As mentioned previously, educational games which focus heavily on the delivery of content without taking into consideration aspects of player enjoyment and motivation are generally viewed as failed attempts to harness the immersive power of video games for learning (Kirriemuir & McFarlane, 2004; Moreno-Ger et al., 2008; Papert, 1998). Although the use of the term in regards to its precise meaning is inconsistent, at its heart immersion delineates a mental state in which a person's awareness or perception of the real world is reduced while the awareness of a fantasy environment is enhanced (Jennet et al., 2008). Immersion aids the illusion of reality of simulated environments and as such is a desirable condition for contextual, experiential learning (de Freitas & Neuman, 2009).

Enjoyment and motivation are important aspects of learning. This is not to say that learning may not occur in un-enjoyable circumstances, but a series of studies by Lepper and Cordova (1992) found significant learning gains for students exposed to motivational learning environments compared to those in neutral settings. Motivation, the provision of an incentive to act (in this case, to gain knowledge), is commonly used as a keystone in the rhetoric regarding the benefits and potential of games in learning. Here, one generally distinguishes between extrinsic, i.e. externally induced, and intrinsic, i.e. self-driven motivation (Ryan & Deci, 2000). The
majority of learning as the result of formal academic instruction can (to this point) be regarded as extrinsically motivated. Intrinsic motivation however, the desire to perform an action for its inherent satisfaction without external benefit, is one of the aspects of digital games which most captures the imagination of educationalists (Bowman, 1982).

In order for students to partake in any learning effort, they must place value on the task set and believe in the possibility of success at the same - otherwise, they are not motivated to learn. Paras and Bizzochi (2005) present the ARCS model (see below) for the development of motivating instructional environments which suggests the consideration of:

- **Attention** strategies for arousing and sustaining learner curiosity and interest,
- **Relevance** strategies to cater for a learner’s needs,
- **Confidence** strategies to foster positive expectations of success, and
- **Satisfaction** strategies providing extrinsic and intrinsic reinforcement of the learning effort (Paras & Bizzochi, 2005)

In a more specific manner but not primarily targeted at educational game design, Sweetser and Wyeth (2005) present a matrix of heuristics for the prediction and maximisation of player enjoyment in games:

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| **Concentration**<br>Games should require concentration and the player should be able to concentrate on the game | - games should provide a lot of stimuli from different sources  
- games must provide stimuli that are worth attending to  
- games should quickly grab the players’ attention and maintain their focus throughout the game  
- players shouldn’t be burdened with tasks that don’t feel important  
- games should have a high workload, while still being appropriate for the players’ perceptual, cognitive, and memory limits  
- players should not be distracted from tasks that they want or need to concentrate on |
<table>
<thead>
<tr>
<th>Challenge</th>
<th>Games should be sufficiently challenging and match the player's skill level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- challenges in games must match the players' skill levels</td>
</tr>
<tr>
<td></td>
<td>- games should provide different levels of challenge for different players</td>
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<tr>
<td></td>
<td>- the level of challenge should increase as the player progresses through the game and increases their skill level</td>
</tr>
<tr>
<td></td>
<td>- games should provide new challenges at an appropriate pace</td>
</tr>
<tr>
<td>Player Skills</td>
<td>Games must support player skill development and mastery</td>
</tr>
<tr>
<td></td>
<td>- players should be able to start playing the game without reading the manual</td>
</tr>
<tr>
<td></td>
<td>- learning the game should not be boring, but be part of the fun</td>
</tr>
<tr>
<td></td>
<td>- games should include online help so players don't need to exit the game</td>
</tr>
<tr>
<td></td>
<td>- players should be taught to play the game through tutorials or initial levels that feel like playing the game</td>
</tr>
<tr>
<td></td>
<td>- games should increase the players' skills at an appropriate pace as they progress through the game</td>
</tr>
<tr>
<td></td>
<td>- players should be rewarded appropriately for their effort and skill development</td>
</tr>
<tr>
<td></td>
<td>- game interfaces and mechanics should be easy to learn and use</td>
</tr>
<tr>
<td>Control</td>
<td>Players should feel a sense of control over their actions in the game</td>
</tr>
<tr>
<td></td>
<td>- players should feel a sense of control over their characters or units and their movements and interactions in the game world</td>
</tr>
<tr>
<td></td>
<td>- players should feel a sense of control over the game interface and input devices</td>
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<tr>
<td></td>
<td>- players should feel a sense of control over the game shell (starting, stopping, saving, etc.)</td>
</tr>
<tr>
<td></td>
<td>- players should not be able to make errors that are detrimental to the game and should be supported in recovering from errors</td>
</tr>
<tr>
<td></td>
<td>- players should feel a sense of control and impact onto the game world (like their actions matter and they are shaping the game world)</td>
</tr>
<tr>
<td></td>
<td>- players should feel a sense of control over the actions that they take and the strategies that they use and that they are free to play the game the way that they want (not simply discovering actions and strategies planned by the game)</td>
</tr>
<tr>
<td>Clear Goals</td>
<td>Games should provide the player with clear goals at appropriate times</td>
</tr>
<tr>
<td></td>
<td>- overriding goals should be clear and presented early</td>
</tr>
<tr>
<td></td>
<td>- intermediate goals should be clear and presented at appropriate times</td>
</tr>
<tr>
<td>Feedback</td>
<td>Players must receive appropriate feedback at appropriate times</td>
</tr>
<tr>
<td></td>
<td>- players should receive feedback on progress toward their goals</td>
</tr>
<tr>
<td></td>
<td>- players should receive immediate feedback on their actions</td>
</tr>
<tr>
<td></td>
<td>- players should always know their status or score</td>
</tr>
</tbody>
</table>
Immersion

Players should experience deep but effortless involvement in the game

- players should become less aware of their surroundings
- players should become less self-aware and less worried about everyday life or self
- players should experience an altered sense of time
- players should feel emotionally involved in the game
- players should feel viscerally involved in the game

Social Interaction

Games should support and create opportunities for social interaction

- games should support competition and cooperation between players
- games should support social interaction between players (chat, etc.)
- games should support social communities inside and outside the game

| Table 9: Heuristics for the prediction and maximisation of player enjoyment in games (Sweetser & Wyeth, 2005) |

These conditions by and large mirror those set out by Desurvire, Caplan and Toth (2004) and present one of the few examples of emerging attempts to develop guidelines for (educational) game design (see discussion section 2.3 from p. 61). Based on personal gaming experience, the author judges this model to be sufficiently developed to act as a basis for ensuring the enjoyment factor in the Conservation Game during development. Some of the "enjoyment elements" presented in the above model are briefly expanded upon in the following in the context of the CG with reference to other literature. Those elements from the above model designed to trigger learning in the CG, such as the use of a tutorial, the provision of clear goals and constant feedback are discussed in more detail in the section on meeting learning outcomes from page 216.

CHALLENGE

It has been shown that games requiring complex problem-solving and higher order thinking skills including visualisation are generally rated highest in terms of player enjoyment compared to simpler forms of play (Amory, Naicker, Vincent & Adams, 1999, p. 317). As such, and particularly in the context of tertiary education, games employed in this setting should be designed to pose a valid cognitive and academic challenge to players. While the Conservation Game is proposed as an introductory tool to the understanding of building conservation issues and
processes, it should nevertheless aim to replicate the complex multi-stakeholder negotiation environments common to conservation and heritage-led regeneration projects. It is important to guide players into a game and provide game play which is neither too challenging nor too simple (Gee, 2003; or as outlined under "challenge" and "player skills" in the Sweetser & Wyeth model), while providing a player with appropriate skill progression.

To that effect, it is necessary to clearly outline the various goals of play to the player at appropriate times. Swartout and van Lent (2003) suggest the constant presence of three levels of goals during game play: short term goals (collect magic keys), medium term goals (aid the villagers in rebuilding their town), and long-term (overarching) goals (save the world). In terms of the Conservation Game, these goals would naturally have to be set in a meaningful conservation context. Nonetheless, they are designed to provide the player with an array of meaningful (at least in the context of the game fantasy) tasks of differing importance and urgency leading up to the overall goal, the successful completion of the conservation/regeneration project.

Challenge is a key component to play (Crawford, 1982; Habgood, 2007) and as such omnipresent in all forms of game design. However, the importance of challenge, the relative weight of competitive elements (aimed against others, the computer or the self) varies according to game types. In social simulations (such as SimCity or Second Life), challenge is less central to game play than in first-person shooters. In terms of the Conservation Game, challenge should be included as obstacles to overcome in the process of completing a game project. However, the CG should create and reinforce player awareness of the importance of true understanding of a site and its facets prior to commencing planning or even work. As such, exploration is likely to be a more significant game play element than challenge for supporting the learning gains expected from the CG.
NARRATIVE

In the creation of appealing game worlds and fantasy contexts, narratives, the storytelling employed to substantiate game play, are of significant importance. 'Narratives have the peculiar habit of making readers (players, viewers, interactors) care a great deal about the events they represent' (Holland, Squire & Jenkins, 2003, p. 38). Waraich supports this view and presents narrative as both a tool for understanding content and content relationships as well as a structural mechanism for guiding players through game world and game play (2004, p. 98). Apart from their obvious contribution to game enjoyment, the author regards both the emotional and the structural properties of game narratives as highly significant for the Conservation Game and proposes (as previously stated) a narrative-led game scenario. Based on spatial relationships rather than temporal (linear) ones, games utilise space and architecture as an infrastructure for narratives (Carson, 2000). A 'Because narrative is a type of causal thinking in which the narrative (cognitive) schema identifies categories (protagonist, situation, conflict, outcome, etc.) and relevant types of relationships (temporal, motivational, procedural), the environment allows players to come to their own conclusions in cause and effect vignettes' (Dickey, 2006, p. 2). In the context of the Conservation Game, this means that exploration (as mentioned above) could trigger new aspects of the story to unfold and as such enhance the player's understanding of the in-game project and the progress towards game completion in equal measure.

In terms of programming, the inclusion of complex narratives (particularly those which claim to be open-ended), can pose significant problems as every option in a narrative tree leads to ever more options which quickly becomes unmanageable in its exponential growth (Crawford, 2003). Even a simple and relatively linear narrative can be compelling and aid immersion and player identification with the game environment. The use of a narrative, which increases the complexity of game play and as such increases development effort, must also be regarded in a financial sense. As financial implications of development are discussed in sections 6.4 and Chapter 7, it suffices to state at this point that the Conservation Game as a non-
commercial teaching application should strive to be of the highest possible quality (including narratives) within the limits of the development funding which may be secured (p. 243).

**Meeting Learning Outcomes: Repetition, Reflection, Feedback**

As the Conservation Game proposal is modelled after Shaffer’s Epistemic Games, it builds on similar principles in terms of learning and content delivery. Above all, Epistemic Games (and with them, the CG) promote learning in context, the acquisition of skills, knowledge, values and attitudes in a relevant, realistic but simulated (professional) environment, to the provision of which digital games are excellently suited (Arnseth, 2006). The role play element involved in these scenarios encourages students/players to engage more deeply with the scenario and in turn feel responsibility for actions taken within the scenario and authorship over the results of these actions. This engagement with and care for the (simulated) environment in question (i.e. direct experiences) foster deep learning and long-term retention better than lecture-based (indirect) learning experiences (Duerden & Witt, 2010). The player roles available in the CG must therefore feel real, and any actions taken in the game should not only feel relevant within the game fantasy (the conservation internship) but also have a noticeable impact on the game world.

Figure 32 (p. 217) illustrates a structural example of how player decisions and actions are proposed to trigger programmed game adaptation rules leading to a wide variety of available game behaviours and a number of subsequent game end states (see also section 6.3.3 on assessment).

In addition to learning through the observation of the consequences of different actions, players are expected to internalise concepts through repeated interaction with them similar to revision (Coyne, 2003). The game structure outlined in Figure 31 (section 6.3.1, p. 204) illustrates the repetitive nature of in-game projects, which despite increasing complexity in essence require the same approach, although with varying details.
Another cornerstone of learning in Epistemic Games is the reflection on personal actions through feedback provided by a mentor. The necessity for reflection in the development of understanding and knowledge is well publicised (Kolb, 1984; Rieber & Noah, 2008) and a key element in Kolb’s experiential learning cycle (see p. 35). Reflection in the context of Epistemic Games and the Conservation Game is initially a retrospective activity (reflection-on-action) induced through mentor feedback (with the game acting as the main mentor and teachers take on the role of game facilitators) which gradually develops into the immediate, self-motivated reflection-in-action characteristic of creative problem-solving by practiced professionals. In order to develop (rudiments of) this reflection-in-action in the Conservation Game, feedback should be provided immediately and constantly during game play through different features embedded in the game play (objects, characters, counts, etc.) (Fish, 2005). This form of endogenous reflection, which is so incorporated into both game play and game fantasy that the player’s immersion in the game is not broken if he/she engages in reflection, is recommended as a valuable aspect of successful educational games (Habgood, 2007; Paras & Bizzochi, 2005).

Figure 32: In-game decision routes and impact on game behaviour (adapted from Moreno-Ger et al., 2008, p. 2536)
The following section will give an overview over the elements of game play in regards to the above presented learning tools (repetition, feedback, reflection). In other words, it describes how the author proposes the game to be played, and which aspects of the game are suggested to trigger learning.

**GAME PLAY OUTLINE**

As the Conservation Game is proposed as what is effectively a role play scenario, players will "become" conservation project interns for the duration of the game. Each player should be able to select an in-game appearance (avatar) from a choice of body and face models at the initial start-up. Although arguments are being made that avatars act as a form of barrier between game interface and player and as such reduce flow (a state of deep immersion) (Nacke & Lindley, 2008, p. 81), the representation of the self, be it realistic or fantastic, in a game aids identification with the game content through the provision of emotional links to the playable on-screen character (Consalvo, 2003). As one of the key elements in the development of epistemic frames lies in the identification with a professional group, the author suggests the availability of (mildly customisable) avatars as a tool to increase the players' connection to the game fantasy and the role play.

Upon entering the game, the player as complete conservation novice is thrown into an unfamiliar environment with unfamiliar requirements. The game tutorial acts as an orientation period during which the controls, game world interactions and play requirements are being introduced to the player. In order to situate the tutorial endogenously within the game fantasy (as suggested by Sweetser & Wyeth, 2005 - see Table 9, p. 213), players could be taken on a virtual field trip to a conservation site where the various aspects of conservation and game play are explained to them.

After completing the tutorial, the players progress to the actual role play scenario, in which they are required to take on the role of an intern in a firm which plans and executes conservation and regeneration projects (taking into account
their selected professional background for varied specifications). The game in its capacity as main project mentor should initially prompt players to perform certain actions in the early stages of Project A (Figure 31, p. 205). These prompts could for example reach the player in the form of memos sent to the intern, telephone calls from the virtual superiors or requests from local authorities. Such endogenous guides to gameplay are an essential part of the Conservation Game's proposed feedback system.

**Feedback & Resources**

As stated previously and made explicit in Sweetser and Wyeth’s (2005) game enjoyment guide, feedback has to be provided instantly and constantly throughout gameplay. Players should at any time be clear about their performance, i.e. the relative quality of their chosen actions, through the availability (or non-availability) of the two proposed main resources (or gameplay restrictions) for the Conservation Game: budget (i.e. funds) and reputation.

**Budget** represents the player’s capacity to specify project-relevant actions and repairs based on their relative cost. Each project is given a set budget and each survey, each consultation, each repair has a set price. Budget is the game resource (or indeed restriction) which ties the game fantasy most firmly with the real world, as a player will not always be able to afford all the interventions he/she would like to specify. As such, budget is the game aspect which is responsible for illustrating project planning, negotiation and compromise to players. In order for a player to be able to plan the use and spend of his/her budget, the game should offer the possibility of projecting total project cost prior to taking actual, irreversible action.

**Reputation** is the second game resource and is controlled by the player’s actions such as the choice and quality of interventions, the thoroughness of game world exploration, the quality of stakeholder interaction and negotiation and so forth. Reputation is "given" or "taken away" by all stakeholders involved in the project (see below) in accordance to their (pre-programmed) attitude towards the possible
and actual player decisions. Reputation is expected to be of closer relevance to the development of building conservation understanding than budget as it is a direct mirror of the quality of a player's actions. The decision to convert a structure into a community centre instead of a retail unit may yield less revenue but may increase the public opinion of the planner (i.e. the player) and in turn, increase reputation. The community centre may at the same time prove to be a more sympathetic new use for the sensible historic structure and as such again increase reputation. The selection of options using the desired conservation vocabulary could also gain a player reputation from (digital) conservation experts. Reputation thus provides immediate feedback to the player.

Aside from providing a key feedback component, reputation is also designed as an entity of game play control. Just as is the case with real-world interaction, the services and resources available to a player are linked to the player's reputation with the above mentioned stakeholder groups. In other words, if a player has not gathered sufficient reputation with, for example, the digital equivalent of English Heritage, he/she should not be given the option to employ specialist conservation-savvy craftspeople on his/her construction site, which in turn would result in lower-quality refurbishment and consequently, a lower-rated game end state. The acquisition of reputation should be linked to compromise, as it is nigh on impossible to please every stakeholder in every conservation/regeneration project. Players should be made aware (by the game) how much reputation is required for each of the possible intervention options as a further aspect of game play feedback. Reputation is also linked to budget, as the employment of above exemplary specialist craftspeople is certain to increase project cost but will lead to a better result, in turn increasing reputation.

An example for the employment of reputation in guiding player behaviour is provided by the early stages of the proposed in-game projects. Players start out with a set budget (gauge full) and (almost) no reputation (gauge empty). Players should be able to carry some reputation points over from Project A into Project B etc. as an incentive to do well from the beginning. In order to gain reputation at the
start of a new project, the player must explore the project setting, investigate the built structures, converse with stakeholders, residents and neighbours and find out about planning restrictions. In other words, the player builds up a modicum of "trust" with the stakeholders and unlocks available actions through reputation points gained through exploration. In later stages of the project, the player must then economise and expand on this initial store of reputation in order to be able to specify and carry out interventions.

**Reflection**

In many ways, reflection is linked to feedback and the way it is provided. As the physical act of sitting down to discuss actions with a mentor is not available in the game setting due to the fact that most implementing teachers will be no conservation experts, the game itself must provide opportunities for reflection. Some mentor-like feedback may be given through interaction with non-player characters (NPCs). However, it is suggested that a more potent option for reflection-on-action should be provided to aid learning. In addition to the gauges of budget and (especially) reputation, which should be visible to the player at all times, a player should have access to a log which stores key player actions and their respective effects and implications. Thus, a player has the option to see that his/her latest action caused him/her to lose reputation with one stakeholder group due to marginalising their agenda, while it gained the player reputation with two other groups. Such a tool embedded in the game fantasy is an example of endogenous reflection (Paras & Bizzochi, 2005).

**Stakeholders (non-player characters)**

The author proposes the main stakeholders in the game to reflect the parties most commonly involved in conservation/regeneration projects as the baseline of non-player-character (NPC) interaction in the game. For a typical game project, these could encompass:
- the public in single or multiple capacities according to the complexity of the project (such as residents, neighbours, interest groups etc.)
- the commissioning entity, i.e. the client
- the conservation specialists, i.e. English Heritage
- government agencies (such as for example the Environment Agency)
- the local authorities

In addition to the above stakeholders with a direct, vested interest in the game project, the player should be able to interact with NPCs representing:

- the workforce including general and specialist craftspeople
- independent surveyors and consultants
- superiors and co-workers in the "office"

While the demands of and negotiations with the first set of NPCs are designed to challenge the player, the second set should act as guides and sources of information - yet both play an important part in the feedback system as they constantly judge a player’s actions. Due to the sensitive, often emotional nature of building conservation projects, all stakeholders should represent a distinct opinion in order to reflect the multi-layered conflicts and agendas surrounding conservation.

Beyond the stakeholders one might also encounter on a real-world project, the author proposes the adaptation of the to-be-conserved structures, i.e. the buildings, as characters in their own right. In the heritage trade, one often speaks of the character of a building or place as if the latter quite literally had a story to tell, and uses the term reading a building for deducing its specific qualities. Due to the affordances of a digital environment, such a building could indeed come to life in some form and present the player with information not available elsewhere - reading becomes speaking with within the game fantasy. Buildings should speak predominantly of themselves, recounting tales of their "lives" and giving clues as to their physical and chemical (i.e. material) composition. Interaction with the
buildings should be unlocked through exploration of the site and is designed to pique the interest of the player to actively explore and discover more.

Events

As briefly discussed in section 6.3.1, the author suggests the inclusion of spontaneous events into the game play as a form of challenge for the player. Such an event, typically a suddenly-occurring, unforeseeable problem, should have sufficient impact on the game environment (i.e. the project circumstances) to cause the player to adapt his/her strategy to deal with the problem. Inspired by the witnessed Game Developer role play (see p. 174), these problems could range from simple matters such as a power outage or bad weather which would cause a simple delay to the project and incur relatively minor cost to more significant impacts on the game plan such as the discovery of important archaeological artefacts which could cause the project cycle to re-set. These randomly triggered events and the resulting challenges should develop a player's ability to act creatively under pressure and can, in terms of assessment, be regarded as a form of test for the player's understanding of (conservation) project principles.

Achievements and Winning

Similar to commercial games, which do not only offer players goals ranging from the immediate future through to the completion of the game but also constantly reward players for reaching those goals, the author suggests the design of a set of achievements for certain types of desired game play. Typically, achievements in commercial games appear on the player interface as a form of badge and are unlocked by completing certain quests, collecting a certain number of special items, completing a part of the game in a particularly difficult setting, or through world exploration. In the context of the Conservation Game, exploration and discovery certainly appear valid subjects for player achievements. Further achievements could be linked to particular prowess in negotiation, planning, design execution, use of conservation language and vocabulary, completion of multiplayer mode and so
forth. The requirements for some achievements should be openly visible to the players, while others (for example the ability to converse with buildings) should be kept secret until they are triggered. Achievements reward players for certain types of behaviour and typically provide an incentive to be "collected", thus nurturing excitement which in turn motivates deeper exploration of the game world.

Winning in the Conservation Game should mean the successful completion of a project and thus the overcoming of obstacles provided by the game play. In the CG, the player struggles against aspects of the game world and perhaps, in some ways, the self as it is not an inherently competitive game. Exploration and understanding should be the central components to game play and as such be designed in a way which makes the game inherently motivating. In other words, the game should be enjoyable for its own sake rather than the rewards it presents.

6.3.3 ASSESSMENT

As previously stated, the Conservation Game can only be integrated with ease into existing built environment curricula across the UK if the delivery system is self-contained and self-sufficient. This self-sufficiency must naturally include any given assessment strategy to be employed in the game. In other words, the Conservation Game must be capable of monitoring player actions and mapping their progress against a predefined assessment model and as such act as both mentor and taskmaster to players during their learning experience. The use of games for assessment purposes is not new (Crisp, 2011; Gee & Shaffer, 2010; Sanchez & Smith, 2007) but the requirements of testing for qualitative learning progress in a fully automated way as demanded by the Conservation Game will necessitate the design of a new and unique assessment structure.

In many ways, the proposed assessment system for the CG is an automated version of the Epistemic Network Analysis (ENA) discussed in section 2.3.1 (p. 74). ENA as employed in Shaffer's Epistemic Games is so far confined to manual data input and evaluation and is therefore unusable for the CG in its present form.
Nevertheless, it is feasible that a slightly simplified version could be digitalised and automated to form the basis of player progress evaluation in the CG. ENA looks for evidence of the formation of epistemic frames in the way students act and express themselves prior to and at various stages during a cycle of task and mentor feedback (Hatfield, 2011; Shaffer et al., 2009). In order to determine a student's progress, his/her results are mapped against the "ideal" behaviour of a subject expert. In the Conservation Game, progress could be assessed in much the same way, although the pupil-mentor interaction, which in Epistemic Games is of a predominantly oral and (individually) written nature, in the CG is somewhat limited to the provision of feedback on actions chosen from an array of multiple-choice options.

Mentoring and feedback are key aspects of pedagogical praxis (see p. 72) and therefore, Epistemic Games. As outlined previously in section 6.3.2, the Conservation Game, lacking the capacity for direct, personalised mentor contact, has to be able to emulate the essence of these interactions and integrate them into the game play. Similarly, assessment must be not only contextual (Rupp et al., 2010) but also fully integrated into the game play in order not to disrupt the flow of the learning experience (Radford, 2000). As with any digital game, immediate feedback on their actions (also integrated in the game play structure so as to aid immersion) allows players to evaluate their performance in a process of reflection-on-(and through practice, in)-action and assist learning. In order to be able to give feedback, the CG must closely monitor each decision a player makes - at the same time, this monitoring builds the basis for the Conservation Game's formal assessment structure.

As previously mentioned, games are essentially state-transition systems (Winskel, 1993), where the actions of players cause the game to transition from one state to the next and impact on the subsequent sequence of available actions. Thus, a player’s choices of actions throughout the game lead to different end states (Figure 32, p. 217). In terms of ENA, every action, every state transition, can be seen...
as a snapshot of the player’s abilities at that particular moment; cumulatively, these snapshots map a player’s progress against the recorded actions taken by a subject specialist. For these snapshots to be used in automated assessments, the developers must specify which "score" effects any individual decision should have, which in turn cumulatively lead to an end score.

Figure 33: Game assessment configuration example (adapted from Moreno-Ger et al., 2009, p. 2535)

Figure 33 illustrates the principle of assigning assessment rules to given action options leading to a preliminary score for a specific event. In the case of the Conservation Game, the choices are almost certainly more numerous than in Figure 33, with some choices only differing in the way they are worded in order to gauge the player's uptake of the conservation-specific vocabulary in section 6.2.4 (p. 200). In the CG, each in-game project should consist of an extensive tree of events or triggers and their associated action options, where every decision taken according to its relative quality adds to or detracts from a player’s score - a representation of the score is at all times visible to the player in the form of the availability of the two game resources, budget and reputation (see p. 219). Not all decisions carry the same score weight, and as is the case with regular conservation projects, many routes may lead to a suitable end result. In order to give players time to adjust to the game mechanisms and scoring system, actions triggered later in the game should carry more weight than those in the early stages.
In terms of integrating the game assessment results into an academic structure, the author proposes that the various end stages may be aligned with academic grades, and that each institution may choose the appropriate number of credits awarded for the completion of the game (instead of a unit) in accordance with institution practice. Alternatively, the student CPD option mentioned in the section on curriculum integration (p. 207) is suggested. However, the nature of the Conservation Game with its constant and instant feedback and challenge-reward structure actively discourages "wrong" decision-making, rendering it hard for players to fail (in academic terms) the exercise. Coupled with the potentially huge motivational power of the game, the grades to be expected from a Conservation Game unit or seminar may on average be higher than those from other, traditionally taught units. By and large, it is expected that active participation in the game exercise alone will raise awareness for and interest in architectural conservation, thus meeting the Game’s most basic learning outcome targets.

In Chapter 5 (p. 176), the author proposes to seek cooperation with and endorsement from professional bodies such as the RICS, CIOB and EH in order for the Conservation Game to be useful to players not only in an academic context but also in regards to their further career. In meeting the standards of the above professional bodies, participation in the CG should ideally be formally recognised (similar to a CPD seminar) as a step towards chartership. In any case, participation in the CG should leave the player with a nationally recognisable award (see development implications in section 6.4).

6.4 Implications for Development & Release

VALUE CONSIDERATIONS

The importance of cultural and economic values in the protection and conservation of historic structures has already been discussed at various points throughout this thesis. An understanding and appreciation of the circumstances
which cumulate in a building’s significance in terms of its evidential, historical, aesthetic, communal, scientific, spiritual or symbolic value is as necessary, if not more so, than an understanding of the economic implications and impacts of its adaptation for contemporary use. In Chapter 5, the values discourse has been identified as not only a central aspect of the built environment sector but also as a broadly accessible route into the concept of architectural conservation, and as such, the Conservation Game (p. 164).

However, while it has been sufficient to this point to confine the aspect of values to those directly related to heritage conservation, their introduction into an artificially created environment such as the CG raises new challenges and requires wider consideration. Flanagan, Howe and Nissenbaum (2005) report the difficulties of integrating moral and ethic values into an educational game. While the key values of the CG remain those directly related to heritage conservation, it is nevertheless important to cast the net wider and be mindful of more general values, particularly in the light of a multi-stakeholder environment such as the built environment sector. After all, conservation has been identified as frequently emotionally and at times politically charged, and the Conservation Game will need to persevere and thrive in such an environment.

In contemporary UK society, a reference to multi-stakeholder environments is nigh on synonymous with one to a diverse conglomerate of different cultures, religions and ethnics. Against such a backdrop, values of all kinds must be treated as equal (Gibson & Pendlebury, 2009). In such, and indeed in any environments, conservation and/or heritage-led regeneration projects (and therefore, the Conservation Game) need to consider wider values such as continuity, identity, diversity, equality, respect, cooperation and compromise. Decisions over the representation of people like a player’s avatar or so-called non-player characters (NPCs) in a game have to be made along similar lines. Values such as these will have to be discussed among the development team and identified and established early in the development process if they are to be fully anchored in the game structure.
Such a list of integral values acts as a guide to game development decisions but must remain flexible enough to allow for adaptations on the basis of new insights which are likely to occur during the development process.

**AESTHETICS**

In educational games, particularly those created by educationalists and academics rather than game designers, the aesthetics of interfaces and game environments are generally subordinate to the educational contents and (in a good game), game-play mechanics (see for example Flanagan, Howe & Nissenbaum, 2005; Habgood, 2007). As such, they are frequently underdeveloped and clumsy, especially to people who have grown accustomed to the elegance and at times breathtaking beauty of technology user interfaces and commercial game worlds. In game design terms, the "eye candy" must be subordinate to game play considerations, as even the most elaborately detailed environments will not immerse players as much as a well-written story and compelling game play mechanics. The older games of the popular *Final Fantasy* series (which always boasts ground-breaking graphics for newly released products), which by now have become obsolete in terms of game graphics, nevertheless still enjoy huge popularity in the gaming community due to their excellent stories, characters and game play. In terms of development investment, graphics are expensive and are thus also often trivialised in educational games.

Nevertheless, the author believes that game aesthetics should be among the main considerations during development. In game development terms, aesthetics describe not only graphics but any aspect which adds to the appeal of a game, creating a conglomerate of interests rooted in how a game *feels*, the fantasy it employs, the story it tells, the secrets it allows a player to explore, the challenges, the way a player interacts with the game (Hunicke, LeBlanc & Zubeck, 2004) - in

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39 *Final Fantasy VIII*, released in 1999, despite comparatively simple, blocky graphics remains one of the author’s (and many other players') all time favourite games
short, everything that makes a game enjoyable. Building conservation and its working environment, as so frequently stated, generally is the focus of strong emotional attachment, which is more often than not triggered by the multi-layered aesthetic quality of a historic structure. While particularly post-war conservation is determined not only to conserve buildings which are deemed beautiful by the public but to extend its protection to otherwise significant structures (the appreciation of which's aesthetic quality has yet to develop over time), it is undeniable that the pleasing aesthetic of historic structures is one of their most successful "selling points" in terms of conservation. The Conservation Game should play to these strengths; a pleasing-to-the-eye Conservation Game is more likely to trigger emotional attachment and thus influence attitudes as discussed in section 6.2.1 (p. 184).

To that effect, it is not necessary to create intricately detailed, realistic 3D environments - graphics can be simple and still maintain a high degree of aesthetic quality, as long as the game's appeal is considered as a whole rather than a disjointed aggregation of game elements (Waraich, 2004). Abstraction, a certain necessity in the representation of game worlds, was once imposed on game graphics in extreme form due to the limitations of technology and may once again become a valid topic of discussion at times where game development is frequently driven by the quest for ever more realistic representation (Wolf, 2003). The author deems it necessary to closely consider the Conservation Game's aesthetics and to take stylistic decisions which carefully enhance the emotional quality of the historic built environment. These stylistic choices should conjure up and play on the familiarity UK citizens will have with the historic built environment but portray it realistically in order to promote real-life relevance rather than adopting the architectural style pick-and-mix approach usually favoured by commercial game design (Aygen & Hauer, 2012).

In terms of the nature of the game environment, the author proposes the use of a 3D learning space which is not only superior to 2D environments in regards to
representational realism but also enables spatial relationships rather than purely linear ones (Dickey, 2006). These spatial relationships and their understanding through use and practice have been discussed in Chapter 2 as important in the development of spatial cognition (p. 58), which in turn is an important life skill for built environment professionals.

DEVELOPMENT

During development, the designers must simultaneously inhabit an artistic and a technical sphere in order to reconcile ideal concepts with feasible reality (Crawford, 1982). Due to the complexity of the Conservation Game and the lack of pre-existing commercial game structure to piggyback on, the game development will need to take place in a cooperative environment where educationalists, conservationists, built environment practitioners and game designers work hand in hand to ensure the best possible outcome. It is essential that fun and learning are considered in equal measure and that a bespoke assessment system is designed and fully integrated into the game play.

In many ways, this thesis can acts as a base element in the design stages of the game development as it covers most of the relevant background research and outlines a game theme, learning targets and a rough delivery method. Nevertheless all suggestions made here will need to be verified and adapted into a concrete game design by above team of specialists. This team must determine and design the ways in which the game communicates with players and vice versa, consider a narrative, finalise the game structure and learning triggers, design and implement a detailed assessment strategy, decide on visualisation and sound, and code and programme the game. During these processes, constant testing and revising is essential, both in terms of functionality of aspects in a learning and teaching tool as well as the success of game play mechanisms and aesthetics (i.e. making the game fun) (Salen & Zimmerman, 2004). Trialling (playtesting) the game outside the circle of developers in progressively larger audiences is particularly important to discern the success or failure of certain features as experienced by people uninvolved in the
game development process. The author further considers it a necessity to use a programming structure such as the SCORM standard\textsuperscript{40}, which increases the compatibility of the Conservation Game with other e-learning software for a potential increase in applicability and longevity of the CG (see also: Alshawi & Goulding, 2006).

As stated on several occasions, the Conservation Game should actively seek endorsement if not accreditation from leading professional bodies in the built environment sector with the medium-term aim of integrating the game into the routes to chartership. Among above professional bodies, recognition from English Heritage and the RICS are judged essential, and endorsement from CIOB and the IHBC being similarly if not equally valued. To this effect, it is deemed necessary to involve representatives of these bodies in the initial design phase and choice sections of the development process in order to ensure maximum usefulness of the final product to a maximum audience of stakeholders.

Just as it is not the purpose of this thesis to discuss the game development in great detail, it is not its task to outline a development budget. Nonetheless, some considerations in this regard should be taken. At this stage of its life and with the author's limited experience in software development practice, it is difficult to come up with a sum to illustrate the expenses necessary to create the Conservation Game without prior consultation of the above group of development contributors. However, it can be reasonably assumed that such a venture comes with considerable financial implications. The purchase of the software should be affordable for interested institutions as the game is not designed as a commercial product and little cost is expected for maintenance beyond the initial development expenses. As for the latter, the success of the game is anticipated to be in the interest of both the heritage conservation and the general built environment sector and as such, development funding may be secured through regular grant routes for

\textsuperscript{40} SCORM (Sharable Content Object Reference Model): current de-facto industry standard set for e-learning software which delineates how code should be written in order to maximise compatibility with other e-learning programmes (see http://scorm.com/scorm-explained/)
heritage conservation projects such as the Heritage Lottery Fund and education initiatives.

RELEASE & DISTRIBUTION

One of the Conservation Game's key usability aspects lies in the relative ease of potentially nationwide application. Consequently, this ease of application should translate into easy accessibility in a physical sense. Access to the Conservation Game could therefore be based on the principle of purchased accounts rather than purchased software as exemplified by contemporary commercial online games. Players can download the game to any machine they wish, but the game is only playable if the player is logged on using a valid account. Institutions could thus purchase accounts for an appropriate fee for the number of students scheduled to play the game and distribute them among the prospective players. Each student/player would then personalise his/her account with details like name and student number upon initial login, making each account (and thus, each individual player performance) traceable. The author suggests that player accounts should remain accessible to students after the completion of playing the CG as an academic exercise so that they may re-play the game on a home computer in their own time if they so wish.

SUPPORT STRUCTURE & RESOURCES

To complete the delivery system that is the Conservation Game, the author suggests the creation of supporting online resources as a supplement to the game itself. Apart from an online presence in the sense of propagation and marketing (such as a Conservation Game website), this should primarily be a point of interest for players and involved educators. The author proposes the design of an information database with references to conservation in general, relevant jargon, and exemplary case studies similar to the playable game projects. Just as the game, this database should be designed to reinforce the relevance of conservation to the built environment sector as a whole rather than being targeted at conservation
specialists. To mirror the efforts of the CG, this database should be as interactive as possible and reward exploration (if access to the database was linked to the player accounts, the exploration of the database could result in an in-game achievement).

In addition to the database, the provision of an online discussion board or forum could help establish a social environment around the Conservation Game through debate and cooperation and increase the identification of the players with the software and its content (Moreno-Ger et al., 2008). Pivec and Pivec suggest that while a majority of young people frequent online forums as part of their leisure time and entertainment activities, they are generally reluctant to use such technology for academic purposes unless instructed to do so (2010, p. 205). As such, the success of such a forum is difficult to predict, at least with those players who are students. In contrast, Holland, Jenkins and Squire (2003, p. 29) argue that the form of peer-to-peer interaction outside of but concerned with a game are 'a critical part of the gaming context, and in the case of educational games, perhaps the most pedagogically important interactions'. The author believes in the validity of providing the opportunity to connect regardless of projected player frequency, particularly as the CG could also be used in CPD programmes (both within professional as well as HE environments as outlined on p. 208), where learners are increasingly self-motivated and as such more likely to seek out additional information based on interest. To increase motivation to participate in forum discussions, sector experts could be invited to contribute their knowledge and experience and act as a form of online mentoring structure for the students.

Within the above online database and discussion platform, the author suggests the integration of a specific support structure targeted at those educationalists planning on employing the Conservation Game as part of their course. The ease of application and self-explanatory nature of the proposed CG should require very little initial teacher training in order to function within an academic environment. Teachers should be encouraged to themselves complete the game as a player prior to classroom implementation to gain an understanding of the working structure of
the software. To this effect, free trials could be offered to interested educationalists in order to increase game propagation. Nonetheless it is expected that educationalists may have need of more in-depth information about the game structure, mechanics or content or wish to converse with fellow teachers about implementation and success. As such, educationalists should be able to access a specific teacher support section on both the information database and the forum which hold targeted information relevant to organising the implementation of the CG in an academic context.

All in all, the conception and development of such a game is a project of considerable magnitude, in terms of the development itself but also, and perhaps more significantly, in its potential impact on the built environment sector and here specifically, the long-term protection and high-quality management of the historic (built) environment.
This thesis has presented the unique and perhaps controversial attempt to reconcile the vastly different subject areas of historic building conservation, education and digital games into a proposal with potentially significant benefits for the built environment sector in the United Kingdom. While education and the historic environment both have come in more or less close contact with games over the years, a combination of the three is highly unusual. The application of digital games for learning, and more specifically in formal education, is a popular focal point of academic interest and has been copiously discussed in Chapter 2. Digital games have also found their way into heritage applications in the form of interactive museum displays and interpretation devices as well as explorable reconstructions of historic cities and lost civilisations where they, too, commonly perform the function of a learning tool (Champion, 2008). Both areas however largely concentrate on the game as a learning tool for children rather than embracing its enormous potential for adult education as does the Conservation Game.

The proposal of adapting building conservation topics into a digital game environment for education aside, this thesis promotes two further, related but equally unusual and as such automatically controversial proposals for the built environment sector but more relevantly, the heritage trade.

The first of those suggestions, which indeed is rather more of a petition, lies in the acknowledgement of the teenager and young adult in heritage education. Interest grows out of exposure, and in the author’s opinion it is insufficient to introduce young children to the historic environment and expect the childhood fascination with history to carry through to adulthood. On these grounds, the EH education policy of not engaging in higher education (as discussed in section 4.5.5) is hardly comprehensible. During the interviews, one respondent (RICS representative) recounted taking undergraduate surveying students onto a heritage
conservation field day. While prior to that experience none of the students had considered a career connected to conservation, all of them agreed at the end of the field day that conservation was an interesting and worthwhile occupation which they were interested to learn more of. While such a statement can hardly form the basis for nationwide generalisation, it nevertheless underlines that the average undergraduate student may very well be interested in heritage and heritage conservation given adequate encouragement and guidance. Conservation organisations and professional groups are thus hereby called upon to aim to reach out to higher education on a much wider scale and relinquish the deeply ingrained perception that conservation education belongs at postgraduate level.

The second suggestion is closely linked to and indeed builds onto the first in encouraging the general built environment, and here again specifically the formal education routes, to embrace a more holistic approach to education and aim to include a broader scope of taught subjects within a given professional pathway. These could be implemented as elective subjects to give the individual student greater freedom in preparing for a career according to his/her personal interests. Additionally, higher education should seek to encourage the development of said interests, be they established or newly formed, within and beyond the diligently fenced-off professional practices to afford learners a glimpse of the proverbial built environment forest. True to the flavour of this thesis, architectural and heritage conservation are proposed as probable supplementary subjects in a new, learner-centred and holistic higher education environment.

However, the higher education apparatus is largely reactive rather than proactive and as such will require the open support of the industry for any changes to take root. As stated on several occasions throughout Chapters 5 and 6, the Conservation Game must therefore seek endorsement from the industry before any attempts at propagation and distribution may be made.
The Conservation Game as Tool for Learning

As is the case with any contemporary learning application, the Conservation Game drops straight into the decades-old debate surrounding the nature of instruction, and consequently, the nature of learning. By and large, one may distinguish between heteronomous, i.e. traditional learning where contents are decided, structured and presented by a teacher and received by the learner, and autonomous learning, which is largely self-guided or, to use a popular term, learner-centred (Peters, 2000). Regardless of the emergent belief that contemporary education should relinquish the former in favour of the latter, the author recognises the validity and benefits of both approaches in their own right, given a sensible application. In today’s competitive market economy, the ability to determine which information to acquire, and how to go about said acquisition (as promoted by autonomous learning), is undoubtedly a valuable skill for any university graduate to have. Nonetheless the author considers minimally guided instruction unsuitable for novice learners in any domain and finds support in the literature (Kirschner et al., 2006; Mayer, 2004).

The Conservation Game as a tool to introduce built environment students and professionals to the concepts and processes of architectural conservation is therefore predominantly heteronomous in nature in its guidance of players through the key elements of game play and consequently, the conservation project cycle. It aims to facilitate subject exploration through a guided approach and through the rewarding of desired behaviour while simultaneously discouraging undesired decision-making. Beyond a motivational introduction to the subject of architectural and heritage conservation, the CG strives to arouse a player’s interest in conservation which in turn could stimulate autonomous, self-motivated further learning. Despite the above preparation of and guidance towards a central path through the game, the CG nevertheless also offers autonomous decision-making, particularly towards the end of the game where prompts and explanatory feedback are reduced and a player is increasingly left to base decisions on personal preferences and intents.
Within the context of desired and undesired decision-making, one has to briefly touch on the fact that not all players play the same game in a similar fashion. As stated by Flanagan, Howe and Nissenbaum (2005, p. 756) and witnessed on several occasions throughout the author's own gaming experience, some players exhibit a tendency towards playing a game "wrong", i.e. contrary to how it is meant to be played, in order to test boundaries and elicit unexpected game responses. These players succumb to the attraction of a risk-free environment and deliberately choose to fail at game tasks in order to experience the consequences. While such behaviour can lead to learning in its own right, it is not entirely desirable in the context of an educational game where the emphasis perforce lies on "doing things right". Although the potential for such behaviour cannot be ruled out, it is unlikely to occur frequently in a classroom context, particularly if the game exercise is coupled with academic assessment.

All in all, the Conservation Game is a multisensory learning experience, in which the written word, the spoken word (in the form of voice acting), images, videos and simulations all form what Peters expresses as the 'cumulation, compression and intensification of [content] presentation' (2000, p. 58) afforded by digital technology. Coupled with its interactive properties, the CG plays on all three methods of experience and consequent knowledge acquisition put forth by Jerome Bruner (1966). Bruner discerns between enactive (direct, active dealings), iconic (dealings based on images, schemata or sketches) and symbolic (dealings based on thoughts, terms and arguments) ways of confronting reality, whereby content presentation should start with enactive material and progress to iconic and subsequently symbolic representations (Haertel, Walberg & Weinstein, 1983, p. 85). In its structuring of learning from direct experience through to conceptionalisation and experimental implementation, this model is similar in principle to Kolb's construct of experiential learning (1984).

Despite making no provision for mentoring and learner guidance, Bruner's model is also mirrored in the Conservation Game where players first experience a
process and learn to contribute to this process which through repetition and reward is internalised as action schemata which in turn may be conversed about and experimented with. In this cycle, learners (players) will benefit from above intensification of content interaction afforded by the Conservation Game compared to traditional classroom-based instruction or even field trips and case studies. The game is projected to influence a player's attitudes towards building conservation through its favourable presentation of the latter in a motivational, fun and engaging environment based on the attitude and behaviour change principles laid out in Chapter 6.2.1 (Biener, Ji, Giplin & Albers, 2004; Fox & Amichai-Hamburger, 2001; Smith & Mackie, 1995). Through a mixture of experimentation, guided action and feedback, the player will become increasingly self-sufficient in his/her dealings with the in-game historic environment as he/she is familiarised with processes and common issues in the course of "beating" the game. Such intense engagement with a topic over a period of time (equivalent to a semester unit as proposed in 6.3.1) based on direct experience and coupled with emotional investment is highly likely to succeed in achieving the proposed learning outcomes and transfer well into a long-term improvement of perceptions towards architectural conservation (see Duerden & Witt, 2010; Shaffer, 2004a; 2006). In addition, it is designed to afford a built environment student with a more holistic view of his/her chosen professional domain and the built environment sector as a whole and as such contribute towards the desired seeing of forests rather than trees.

On a less theoretical note, the quality of guided learning and interest in a subject is also often dependent on the quality and motivational abilities of the respective teacher (Peters, 2000, p. 3). Although a game can never replace the value of personal face to face contact, it nonetheless can present content in a way which is largely free of personal prejudice and disinclination towards a specific teacher.
The Conservation Game as Opportunity for Cooperation

Although building conservation is a subject which has been shown to enjoy principal appreciation and baseline support from the majority of built environment sector representatives participating in the research process, it remains a fairly isolated discipline in terms of distribution of competencies, at least in the UK. The overall and somewhat controversial impression gained from the results of Chapters 2 and 4 is one of deliberate reclusion on the part of the UK conservation sector, particularly as far as the propagation of the heritage discourse in higher education is concerned. Most conservation education programmes aim at developing specialism, thus creating a cycle which excludes all but the most learning-motivated built environment practitioners who actively seek out these programmes. A heavy emphasis is placed on craft skills training, which despite its undisputed relevance is of little to no benefit to the vast amount of general built environment graduates.

On the other side of the chasm, the construction- and new-build oriented built environment sector acknowledges the principal value of architectural conservation but largely perceives it to be of little to no relevance to their respective professional domain. Despite a general tendency towards calls for more inclusive, holistic education in the literature (Chapman, 2009; Klostermann, 2011; Newton, 2009;), the multi-disciplinary and multi-stakeholder built environment sector remains heavily compartmentalised both in regards to professional practice as well as formal education. As such, peripheral subjects like building conservation and heritage-led regeneration are seldom granted official recognition in curricula. This effect may even be intensified by the subject requirements imposed as part of the widely esteemed and desired accreditation of courses by professional bodies.

What remains is a subject which everybody seems to appreciate, yet which one side is reluctant to disseminate on a broad basis while the other side is effectively convinced (perhaps by this very reluctance) of the irrelevance of the subject for the built environment professions. Thus construction and conservation, two of the main driving forces of professional built environment practice, at best consider
themselves remotely related to the other and at worst harbour mutual resentment towards the other. The author considers both positions absurd and outdated in an age of information and cooperation and in the light of a built environment sector which is heavily honeycombed with traditional construction and protected structures (Clark, 2001b). The author therefore supports the development and propagation of a target-oriented discourse between the two sides on the basis of common values with the aim to increase mutual understanding and (in the long term) project efficiency as well as the quality of historic building conservation, regeneration and management.

In Chapter 5, the multi-layered nature of heritage values was identified as a suitable starting point for the establishment of a discourse between conservation idealists and construction pragmatists. The Conservation Game has been proposed to be developed in a way which attempts to reconcile the differing positions of theory-led and practice-led approaches into an environment which effectively demonstrates the relevance of both. In many ways, conservation practice and theory are like the proverbial chicken and the egg and the eternal question of which first developed out of the other. In the end, the answer to this question matters little, as both are significant elements of a cycle and continuously influence each other. However, the poultry metaphor illustrates that while idealists and pragmatists may have differing views on a subject, they all contribute to the entirety of the subject in valid and enriching ways.

The author therefore regards the Conservation Game not only as the previously discussed learning tool, which of course is its intended primary function, but also as an opportunity to kick-start the above dialogue. Due to the game's projected complexity, the design and development phases will necessitate the involvement of important sector representatives from all parties concerned in order to create a valuable and widely useful product. Given an initial favourable disposition of all involved stakeholders towards the conservation game, the development will then require creative input from various practitioners, English Heritage, the RICS, CIOB,
the IHBC and educationalists as well as game design specialists. As such, the development of the Conservation Game could create a platform of mutual interest in which all parties are prepared to invest and from which a desire for increased future cooperation may grow. Although it has to be recognised that the sector will not change overnight, it may reasonably be suggested that if planned and propagated well, the CG could thus be of tangible benefit to the sector in more ways than previously suggested.

The Conservation Game as (Development) Challenge

The above complexity of design and development harbours perhaps the biggest challenge to the proposal of a conservation-based digital knowledge and information delivery system. If the Conservation Game is to be respected, valued and consequently adopted on a national scale as a licensed teaching tool, the quality required from this project necessitates the sort of development infrastructure (both intellectually and physically) which can no longer be provided by a single programmer in a shed, as was the case when digital games were in their infancy. The custom development of a standalone learning software which is deep enough to allow for meaningful interaction and complex learning is perforce considerably more time- and cost-intensive as the adaptation of an existing commercial game (Moreno-Ger et al., 2008). Coupled with the proposed feature of automated assessment of player performance, the design and development of the Conservation Game under the lead of an experienced game designer is estimated to stretch over some years, taking into consideration that the professional input of built environment sector representatives should be continuously sought.

As with nearly all aspects of life, the availability of funding will largely determine if and how the Conservation Game comes to life, and indeed how long this process is going to take. On the very first page of this document, the author briefly touches on the notion of (large-scale) heritage conservation as a luxury commodity which at times of economic hardship frequently takes a back seat in the allocation of public funding. Even before the banking crisis in 2008, the government grants allocated to
English Heritage alone had taken a real-term reduction of £130 million over the earlier decade (Commons Select Committee DCMS, 2011). Given the current financial climate (as of 2012), it is conceivable that the investment of a significant amount of public grant money in a venture which does not have an immediate rescuing effect on any physical structure but rather aims at long-term sector improvement may be regarded as too adventurous a spend for the time being. The proposal outlined in this thesis thus comes at a decidedly unfavourable time when spending reductions internationally force budget cuts to even the most immediate frontline services. Funding from the commercial game sector is doubtful as an investigation into game world design practices in 2008 (M. Hauer, unpublished MSc dissertation) suggested that the realistic, accurate portrayal of historic environments does not rank highly in the development of commercial games.

Against this background, the author does not realistically foresee the realisation of the Conservation Game within the next five years. Nonetheless the preparatory stages of the design and development phases should be pursued, as the author regards the securing of interest and cooperation commitments from the key bodies in the built and historic built environment sectors (such as EH, RICS, IHBC, CIOB etc.) as a prerequisite for actual development. As mentioned on several occasions, the input from and product endorsement of these bodies is considered essential for the success of the software, as it promotes trustworthiness which in turn encourages product implementation. Development costs could be reduced if the game was primarily developed within an academic environment, that is to say, a research institution which features game development expertise and an interest in the promotion of the heritage discourse.

Another concern for the applicability of the Conservation Game to be addressed in the development phase lies in the short life span of consumer goods based on digital technology. While the average home computer is unlikely to exceed a life expectancy of five years, some commercial digital games may only have a shelf life of six weeks (Vaughan, 2004). In order for commercial games to be profitable, they
have to generate enough sales during their shelf life to at least break even with development costs. In the case of non-profit ventures such as the Conservation Game, the lifespan itself is a measure of success as it is the accumulative learning gains from group after group of students/players and the subsequent benefits for the environment which ultimately make such a game worthwhile. As such, the Conservation Game must aim for as long a projected lifespan as possible and any considerations in that regard must be embedded in the development from the very beginning. In real terms, this means the creation of the game environment in such a way that individual aspects can be altered or added to over time if required, and avoiding the use of overly specific details which are likely to change over time, such as for example detailed references to conservation-relevant planning legislation.

If planned with longevity in mind in regards to presentation (graphics and interface) as well contents and mechanics, the Conservation Game may well be a relevant teaching tool for several years. Some commercial games continue to be played long after their effective sales period has ended, testifying to the previously discussed fact that a well-designed game does not require the very latest in graphics and game engines to significantly outlive its sell-by date. *Final Fantasy VII*, released in 1997, remains one of the most iconic RPGs (role playing games) of all time, while the MMO (massively multiplayer online game) *World of Warcraft* was released in 2004 and is still selling well due to constant updates to the game world. However, in the fast-changing context of digital technology, even the best thought-out educational software cannot compare with the life span of a textbook - on the other hand, this is precisely what the Conservation Game never meant to be in the first place.

**Originality and Contributions to Knowledge**

As demonstrated in Chapter 4 and supported by the literature - or rather, the lack thereof -, this thesis has verifiably established a discrepancy between the principal support for conservation-related education on behalf of the UK built environment sector and its actual implementation, specifically within the context of
higher education. Previous publications have hinted at shortages in conservation education programmes (Preston, 2006) and, consequently, a lack of conservation skills in built environment practice (EH, 2000; NHTG, 2008). However, secondary data on building conservation in HE (outside of specialist conservation courses) is virtually non-existent. Through the examination of the current provision of building conservation education programmes, both within and outside of higher education, this thesis has confirmed an acute shortage of programmes aimed at delivering conservation baseline knowledge in general, and for undergraduate students of built environment degrees in particular (sections 4.2.2, p. 103 and 4.3, p. 118). The necessity for action in regards to the amelioration of these circumstances becomes apparent by setting above shortages against a backdrop of a built environment sector heavily characterised by historic structures (be they protected or not) and the fact that almost every built environment professional can be expected to deal with the historic environment at least on one occasion during his/her professional career (Baker & Chitty, 2002; EH, 2000; section 4.5.5, p. 157).

Conservation and heritage education is, as of present (and illustrated in the inventory, survey and interview data), widely focused on young children on the one hand and seasoned professionals on the other, leaving in its midst a vast age and knowledge gap which is hardly catered for. Within this stretch and based on the direct implications for the (historic) built environment, the above data suggests the promotion and implementation of baseline conservation education programmes in and around formal built environment education pathways in the tertiary education sector. In other words, this thesis proposes the active and engaged integration of the UK built environment undergraduate student into the heritage and conservation discourse. To this effect, the thesis has outlined a model curriculum and assorted conservationist’s vocabulary for nationwide novice conservation education in UK HE developed from national and global academic and professional standards and practice guides such as (among others) the QAA UK Quality Code for Higher Education (2011-13), the ICOMOS Guidelines for Education and Training in the Conservation of Monuments, Ensembles and Sites (1993), the EH Conservation...
Principles, Policies and Guidelines for the sustainable management of the historic environment and the RICS UK Practice Standards (Historic Building Conservation) (2008) (p. 189). This curriculum as suggested in section 6.2.3 (p. 195) is designed to foster a coherent and balanced understanding of the currents and fundamental laws of the sensitive, valuable and controversial multi-stakeholder environment with historic building conservation rooted in a motivational, practice-relevant delivery approach.

As an example of said delivery approach, the thesis suggests and outlines the principle adaptation of the above curriculum in the form of an experiential digital game through which the learner can witness and experience the key characteristics and working processes of conservation practice within the wider built environment sector. Through exploration, manipulation and reflection, the learner gains an understanding of building conservation principles and processes in a simulated work practicum or placement based on the model of D. W. Shaffer's Epistemic Games (Shaffer, 2004; 2006; 2009).

This proposal, founded on evidence from the data collection process, established learning theories and best practice approaches from game based learning research, contributes to several academic discourses. It introduces the fairly static practices of building conservation, and here specifically conservation education, to the concept of game based learning and suggests a way in which conservation contents can be presented and explored in an interactive, dynamic, engaging and motivational (digital) environment suitable for HE (section 6.3, p. 202). In the same breath, it introduces UK built environment higher education pathways as well as professional bodies from the industry and built environment sector to the concept of building conservation education in the context of broad, inclusive approaches to subject delivery, aiming to foster productive discussion and increased cooperation between conservation, education and practice. Further, the game proposal, and at its core the developed conservation novice curriculum,
through its target group selection consciously raises the profile and supports the acknowledgement of young adults in heritage and conservation education.

The conservation game proposal at hand also reinforces Shaffer’s work and extends the concept of Epistemic Games through the suggestion of a fully digital, self-assessing feedback cycle to develop from what in its current form is a predominantly manual process (Shaffer et al., 2009). Through the game proposal, the thesis further advocates the introduction of Epistemic Game theory and practice into adult education, extending its current focus on secondary education and adding to its potential areas of application. In this context, the proposal further contributes to the concept of serious fun (Rea, 1997) and general game based learning discourse in outlining the application of an enjoyable and fun but at the same time relevant and true-to-life learning model within the confines of formal higher education.

**Limitations**

**RESEARCH PROCESS & DATA**

Although the implications of this thesis for the promotion and development of conservation education materials for novice learners are of global relevance, the thesis project itself was limited to a UK scope early on. The United Kingdom’s built environment sector’s special composition of a dominant property market interlaced with a uniquely high number of buildings under statutory protection (compared to other countries) render it an ideal case study object, as any research findings in such an environment of relative extremes are likely to be more pronounced than elsewhere. For this reason and for reasons of straightforwardness and accessibility, the data collection processes detailed in Chapter 4 are purely focussed on the UK, although they are based on a more comprehensive, global view and evaluation of building conservation concepts as presented in Chapter 2.
The main focus of the primary data collection process in this multidisciplinary study lay in establishing an evidence-based understanding of the intellectual grounds (and respective practice fields) where the domains of building conservation, higher education and general built environment practice overlap. As such, this could have signified a more specific focus on either design-related or management-related built environment degrees in the context of drawing up the inventory of relevant courses as detailed in section 4.2.3. (p. 107). The decision to only include such courses as focus on the appraisal, development and management of the built environment and the execution of design rather than its creation is based on two factors. On the one hand, architectural and architecture-related courses generally feature architectural history, thus outfitting their students with a basic understanding of traditional use of forms and construction. On the other hand, design disciplines are commonly taught in a studio environment which is intensely focused on individual (design-related) problem-solving and as such promotes reflection-in-action actively and early on. Students of non-design built environment degrees are most commonly not afforded an introduction into traditional design and construction and are further predominantly taught in lecture formats. The study of and subsequent proposal for the amelioration of conservation education in built environment appraisal and management courses as exhibited in this thesis was chosen in response to the more pressing nature of the conservation knowledge deficiency in precisely those courses.

Since all data collection centres on a highly specific field, namely that of historic building conservation education in general formal built environment pathways in UK tertiary education (and here, specifically undergraduate degrees), the relevant data pools are of an accordingly limited size. Through the employment of four different but related research tools (inventory, survey, interviews, teaching practice), the research question and field have been illuminated from a multitude of angles, thus validating individual results and contributing to a more comprehensive understanding of the above. The (non-specialist) inventory and subsequent survey take into account all relevant undergraduate degrees in the UK, while interview
participants were selected from a range of backgrounds and professional assignments and geographic locations to ensure a high level of data fidelity.

All necessary avenues of inquiry were pursued to describe the research field as relevant to the research question. Nonetheless, given a wider scope and more time, it would have been of benefit to include the student's view of building conservation education into the data gathering process. The inquiry model presented in Chapter 4 focuses largely on education decision makers, industry regulators and practitioners and could as such be extended and made more comprehensive by the inclusion of built environment students' and graduates' views of building conservation and the relevance of being informed thereof during formal education.

A further point of improvement for the presented research design would be the employment of interviews earlier on in the research process. In retrospect, the interviews yielded by far the most detailed and comprehensive information on views of building conservation education for built environment students and practitioners. Although they served a valid purpose of triangulating and embellishing the quantitative data in the current model, in which interviews were employed after the quantitative data had been collected, more specific questions could perhaps have been asked in the survey, had the interviews preceded it.

LEARNING AND TEACHING APPROACHES

As evident from the review of literature in Chapter 2 and the game proposal in Chapter 6, this thesis supports the use of experiential learning in the context of built environment and specifically building conservation education. This is not to say that other learning and teaching theories, such as for example Learning Styles (see Pashler, McDaniel, Rohrer & Bjork, 2008) are not equally valid in their own right. The choice of basing the thesis proposal on experiential learning principles is grounded in the widespread support for said learning theory within the field of built environment education research (Peck & Dorricott, 1994; Rogers, Kahne & Middaugh, 2007; Wang et al., 2007)), both in terms of digital and traditional
applications. This trend is potentially based on the theory's association with aspects of (learning through) practice and internship (or praxis) as perpetrated by many built environment professions and indeed, formal built environment education pathways. As such, experiential learning is the most prevalent learning theory in said research field and, as postulated in Shaffer’s concept of pedagogical praxis (2004b), mimics closely the form of mentor-assisted learning common to complex work environments and professional communities such as those found in the built environment.

Game

The proposal to adapt building conservation contents for novice learners in a game environment is, albeit strongly supported in this thesis, precisely that: a proposal, mirroring the author’s personal opinion of how the determined knowledge gap may be closed. Such a proposal may be regarded as controversial and indeed carries within itself advantages as well as disadvantages. A digital game could illustrate the complex multi-stakeholder environment of a conservation or regeneration project in a motivational, fun and relevant environment in which cause and effect relationships can be simulated and explored to an extent which is almost impossible in real life. A game could raise awareness and understanding of building conservation concepts and processes without the need for excessive teacher training due to its self-explanatory and self-assessing nature. On the other hand, a digital game offers reduced capacity for individual, personalised feedback as possible in traditional student-mentor interaction and would increase the already extensive "screen time" for students. Such a game would further imply a complex development process with considerable development cost and yet suffer from a limited life span based on the fast-changing affordances of digital technology.

Although the author believes in the validity of the Conservation Game proposal, it carries as its heart a much less ambiguous aim and method: the development and dissemination of streamlined, targeted and suitable conservation education contents which increase conservation understanding while reducing respective
education inconsistencies across the built environment sector - in short, the propagation of the conservation curriculum for novice learners developed and presented in section 6.2.3 (p. 193). These learning targets and contents are generally applicable and may well be developed in a digital game but may just as well be implemented in a traditional role play or other interactive, practice-related activity. As such, the benefits of this thesis to the protection and conservation of the historic built environment are independent from the game proposal itself, which the author nevertheless considers an important and novel contribution to the discourse of conservation education in the 21st Century.

Further Work

Much of what should occupy this section has in fact already been outlined in Chapter 6 in the proposal of a custom-built Conservation Game. Of the game development itself not much will therefore be mentioned at this point beyond the suggestion of the immediate next steps, which should lie in the liaison with relevant professional bodies and organisations and the securing of their support and cooperation, directly followed by the search for a suitable game developer. Once these steps have been taken and initial consultations have taken place, the development timeframe and cost may be estimated and the quest to secure funding may begin. As actual development is fully conditional upon the availability of funding, little about the Conservation Game may be set in stone before financial backing can be secured.

The Conservation Game is primarily proposed as a tool to introduce the heritage discourse and threshold conservation knowledge and appreciation into the higher education environment of formal built environment pathways, and here specifically non-design professions. Nonetheless, the author sees potential for the game to be applicable in a wider context in regards to not only the previously mentioned CPD programmes but also architectural design domains. For the CG to be used in continuing professional development very little of the game structure would need to be altered from the original proposal. The game could function as a home study
programme and the proposed account-based access would allow individualised tracking of learning progress which could be made accessible to the respective CPD programme provider (i.e. assessor). Playing the CG for the suggested 24 to 30 hours is arguably of much higher educational value than the passive intake of a three-hour lecture (as common in built environment CPD programmes). As such, the CG represents a ready-made CPD programme item for basic conservation understanding and project management, which can be integrated into official routes to chartership.

The adaptation of the Conservation Game for architectural design applications is somewhat more complex albeit immensely fascinating in its possibilities. Beyond a principle introduction into the history of architecture and styles, students of architecture are at times afforded as little exposure to conservation and heritage-led regeneration as their counterparts in surveying, property and construction. In this context of contemporary architecture, the engagement with historic structures is a highly interesting and relevant challenge, of which architecture students could benefit greatly. In order to fit the creative course principles, the Conservation Game would have to be adapted to include a wider variety of design decisions and perhaps the ability for the player to craft and build designs based on their personal preferences. In this context the author points towards the highly successful indie (independently developed and produced) game Minecraft, where players essentially collect and reposition multi-coloured cubes in various configurations to achieve their objectives. This relatively simple but cleverly conceived digital sandbox reminiscent of Lego has prompted the creation of fantastic monuments and cities purely based on the motivational aspects of creation and the intrinsic rewards of personal accomplishment (Figure 34).
The proposed Conservation Game does not claim to represent a revolutionary advancement in terms of educational game design, building on established models in both theory and practice, although its projected medium- to long-term benefit to the UK’s historic environment is considerable. The originality of this thesis rather lies in the attempt to breach the gap between building conservation education and the general built environment sector, putting an unprecedented emphasis on the necessity to include higher education into the heritage (education) discourse. In the light of the increasingly multidisciplinary and multinational work environments of today, one must recognise the value of inciting new interests in adult learners which may lead not only to a broadening of horizons but may open up new discourses and career paths to the mutual benefit of learners, practitioners and, ultimately, the historic environment.
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Appendix A - Glossary

AWARENESS
individual, public or common conscious and principle understanding of an event or pattern (in this context not used in the metaphysical sense of being aware)

CIOB  Chartered Institute of Building
UK-based international professional body for qualifications and standards in construction and construction management; sets and maintains sector standards through HE course accreditation and reputable membership (chartership) scheme

CONSERVATION
as in (historic) building, architectural or heritage conservation
'The process of managing change to a significant place in its setting in ways that will best sustain its heritage values while recognising opportunities to reveal or reinforce those values for present and future generations' (English Heritage, 2008, p. 7)

ENGLISH HERITAGE  (EH)
officially the Historic Building and Monuments Commission for England executive non-departmental public body of the British government, funded by the Department for Culture, Media and Sport (DCMS); central advisor to government on heritage policy and legislation, highest conservation management authority, grant-giving body, management of selected historic properties and visitor attraction business

EPISTEMOLOGY
the philosophy of knowledge and knowledge accumulation; in the context of epistemic frames: the understanding and ability to combine skills, knowledge, values and identity into legitimate action or claims

ICOMOS  International Council of Monuments and Sites
global non-government organisation for the conservation and protection of cultural heritage places; dedicated to promoting the application of theory, methodology and heritage; based on the principles outlined in the 1964 International Charter on the Conservation and Restoration of Monuments and Sites (the Venice Charter)

IHBC  Institute for Historic Building Conservation
UK registered charity and professional body promoting advice and understanding on building conservation issues; supporting conservation specialists and specialism through recognition and promotion of conservation education and a reputable membership scheme
LIKE-FOR-LIKE (replacement)
concept in architectural conservation; if the state of an artefact or element within a
protected structure is beyond repair and needs to be replaced, efforts should be made
to find substitutes of similar or comparable materials, styles and, if possible, crafted
according to traditional techniques

PASTICHE
term for architectural style which emulates historic styles; derogatory, often denotes
"cheap", unsuccessful imitations of the desired style

PLACE
as in heritage place
any part of the historic environment that can be perceived as having a distinct
identity; not restricted to physical forms but may involve characteristics which
contribute to a 'sense of place' (English Heritage, 2008, pp. 7-14)

PRESERVATION
concept in architectural conservation; denotes the protection of the status quo of a
historic structure without the 'management of change' aspect central to conservation
(UK); in North American terminology often synonymous with the UK term conservation

REVERSIBILITY
concept in architectural conservation based on the principle of contemporary
interpretation; denotes the desire to design and implement interventions into a
historic structure in such a way which allows for the potential future reversion of said
intervention without excessive damage to the structure, should new insights or
fashions arise

RICS Royal Institute of Chartered Surveyors
UK-based international professional body for qualifications and standards in land,
property and construction; sets and maintains sector standards through HE course
accreditation and reputable membership (chartership) scheme

SIGNIFICANCE (statement of)
(UK) documented summary of any objects, structures, elements or aspects of value in
regards to a historic structure or place; basis for protection status

UCAS University and Colleges Admission Service
UK organisation responsible for providing and managing application services for a
wide range of subjects and modes of study for British universities and colleges; also
offers comprehensive information service for prospective students
## Appendix B - Built Environment Course inventory

### Key to table
- **obvious HBC contents**
- **discontinued from 2010 (12)**
- **new in 2011 (7)**
- **320+ UCAS points req.**
- **CM** Construction Management
- **BS** Building Surveying
- **QS** Quantity Surveying
- **CM** Construction Management
- **RICS** Royal Institute of Chartered Surveyors
- **CIOB** Chartered Institute of Building
- **RICS** Royal Institution of Chartered Surveyors
- **RTPI** Royal Town Planning Institute

### COURSES as of FEB 2011

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COURSE LEADER SURVEY – CONTACT LETTER

Dear Madam/Sir,

My name is Marina Hauer, I’m a PhD researcher at the University of Portsmouth. As part of my project I am studying current Historic Building Conservation education practices in of undergraduate degrees in property, real estate, surveying and construction management in the United Kingdom - this includes any mentioning the topic in the respective courses, from single lectures, guest speakers, case studies and/or field trips up to actual designated units. Very little information on this is available online, so I was hoping for your assistance. I realise that this is a very busy time at any university, but I hope you can spare me a few minutes of your time to answer five brief questions.

The survey can be found online at: http://edu.surveygizmo.com/s3/483221/Building-Conservation-education-practice-in-UK-undergraduate-degrees

All data will be kept strictly confidential. Excerpts from the results will be mentioned in my thesis but will not include any names or identifying characteristics. Although the survey will ask you for the name of your institution and course, this information only serves to match up the data with another data set previously obtained online, and will not be revealed per se. Before submitting, you will be given the possibility to choose to receive a summary of the survey results at a later stage.

Thank you so much in advance!

Marina Hauer BA MSc
Researcher
Part Time Lecturer
School of Architecture
University of Portsmouth
Dear Madam/Sir,

My name is Marina Hauer, I'm a PhD researcher at the University of Portsmouth. This study focuses on current Historic Building Conservation education practice as part of undergraduate degrees in property, real estate, surveying and construction management in the United Kingdom.

This survey consists of five questions, and completing it will take you no more than 10 minutes. All data will be kept strictly confidential. Excerpts from the results will be mentioned in my thesis but will not include any names or identifying characteristics. Although the survey will ask you for the name of your institution and course, this information only serves to match up the data with another data set previously obtained online, and will not be revealed per se.

Before submitting, you will be given the possibility to choose to receive a summary of the survey results at a later stage.

Thanks in advance for taking the time!

Participation consent *

[ ] I have read the above statement and agree to the provided data being used anonymously as part of the discussed PhD research and thesis.
Please state the name of your institution, and the name of the course you’re supervising (if you’re not in charge of a course, state the one you’re mainly teaching on) - please note that this research is concerned with **undergraduate degrees only**, kindly omit HNDs, Foundation and top-up courses.

Please note that all data will be kept strictly confidential - this information only serves to match up the data with another data set previously obtained online, and will not be revealed per se.

<table>
<thead>
<tr>
<th>HE Institution</th>
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<td>Name of Undergrad course</td>
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<td>Name of Undergrad course (if more than one)</td>
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<tr>
<td>Name of Undergrad course (if more than one)</td>
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</tbody>
</table>

1. Please approximate the average amount of tuition time that is being dedicated to inform your students about Historic Building Conservation (HBC) issues over the course of their degree.

*please tick as many as applicable*

- [ ] Sporadic reference to HBC Issues in general lectures
- [ ] One dedicated session
- [ ] Several dedicated sessions
- [ ] A dedicated project or seminar
- [ ] One or more dedicated units
- [ ] None of the above
- [ ] Other – please specify:  

---
2. Over the duration of a course, which of the following conservation-relevant issues are usually being introduced to students at least on a threshold level (students are familiar with relevant terms and procedures and can make informed statements and decisions on the topic)?

☐ Building Conservation law and government policy guidance / PPS5
☐ Details of the application and Listed Building Consent process
☐ Building Conservation philosophy
☐ Building Conservation practice (case studies, practitioners’ experiences)
☐ Heritage values
☐ Building defects and historic building materials
☐ Refurbishment and Redevelopment issues (physical and ethical)
☐ Availability of grants
☐ Relationship between HBC and the property market
☐ None of the above
☐ Other – please specify: ____________________________

3. Please indicate by whom, in your experience, the decision whether or not to include HBC contents into a course is being made:

☐ Departmental policy
☐ Course committee
☐ Course leader
☐ Lecturer
☐ External factors - cooperation with a heritage organisation, etc.
☐ Accrediting body
☐ Other - please specify: ____________________________
4. Please indicate how the students on your course are being introduced to conservation contents and issues

☐ As part of lectures taught by regular staff
☐ Through lectures delivered by a guest speaker/expert
☐ Through the examination of case studies
☐ Through site visits
☐ Through peer education (i.e. group research and presentations, etc.)
☐ Through role-plays and/or simulations
☐ None of the above
☐ Other – please specify: ______________________________________

5. In your opinion, which of the following constitute a practical hurdle to the inclusion of HBC contents and/or units into existing course curricula?

☐ Availability (or non-availability) of relevant teaching resources
☐ Availability (or non-availability) of Building Conservation experts
☐ Staff’s knowledge of interest in HBC issues
☐ Inflexibility of curriculum
☐ Balance of learning outcomes (at programme level)
☐ Little or no relevance to the course
☐ Other – please specify: ______________________________________

Would you like to receive a summary of the findings of this research at a later date?

☐ Yes please
☐ No thanks
Thank you for taking this survey. Your response is very important to my study!
Appendix D - Interviews

INTERVIEW INVITATION
(sent November 2011)

Dear Mr/Ms ...,

My name is Marina Hauer. I’m a PhD researcher at the University of Portsmouth, School of Architecture. My research is centred on Historic Building Conservation education in the UK, particularly in Higher Education environments. In detail I’m investigating common Building Conservation education practices as part of certain, non-conservation specialist Built Environment degrees such as Property, Real Estate, Surveying and Construction Management. I’m currently in the process of conducting a series of interviews with practitioners, educators and representatives of opinion leading bodies in the sector, and I’m contacting you because I believe your particular experience with heritage education and education policy for EH would be of great benefit to my studies. I was wondering whether you would agree to giving me an interview at some point in the near future? I would like to speak about your experiences with Building Conservation education practices, your opinions on these practices and their potentially disputable necessity, as well as your organisation’s take on the subject.

The interview would be a one-to-one conversational format over approximately an hour’s time. If you are concerned about anonymity, I can assure you that all data will be kept strictly confidential and no names will published in the thesis. I am Portsmouth-based, but would be happy to come to your offices. Should you agree to an interview, please contact me with a suggestion of a time and place convenient for you. I’m generally very flexible. However, due to deadline pressure, I was hoping to have completed my interviews early in the New Year.

If you have any questions, please don’t hesitate to ask. Thank you very much for your time so far!

Kind regards,

Marina Hauer BA (Hons), MSc
Researcher
School of Architecture
University of Portsmouth
marina.hauer@port.ac.uk
07516731572
This interview is part of a series of investigations into the nature of building conservation education in general and as part of UK undergraduate built environment degrees in particular. The participant selection includes educators such as yourself as well as property and conservation practitioners and representatives of opinion leading bodies in the sector (such as RICS and English Heritage). You will be asked questions about your experiences with and opinion on building conservation education practice in the contexts of your institution, the Higher Education system and the professional built environment sector. Some of these questions may seem far-fetched or self-explanatory, because they are designed to suit a range of participants – please do not concern yourself with that and answer as best as you can. There are no right or wrong answers, and any input is relevant to this study.

Please feel free to interrupt and ask for clarification at any time during the interview. Please also feel free to criticise a line of questioning if you disagree with it, or opt not to answer that question. Your response will be handled with care and will be kept anonymous. You may also at any point withdraw from the interview, should you choose to.

Your participation is highly important to my research and I’m very grateful for your time and effort.

Introduction of the Interviewer
My name is Marina Hauer. I have a BA in Interior Design from Austria and an MSc Historic Building Conservation. I am currently in my final year of my doctorate research on building conservation education practices in UK universities and their potential impact on the historic built environment and the property market. If you have any questions regarding my research, please contact me on marina.hauer@port.ac.uk.

Definition of terms
Basic understanding of building conservation:
The ability to recognise and formulate an informed argument on:
The philosophy and motivations behind building conservation
The respective opinion leaders and industry standards
Building conservation processes
Statutory building conservation regulation and related planning restrictions

Built environment degree/course:
A university course concerned with the evaluation and/or management of the built environment and/or the execution of design (does not include design-heavy course foci)
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<th>Topic</th>
<th>Content</th>
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<tbody>
<tr>
<td>0</td>
<td>Introduction of the interviewer, topic, procedure; Participant information sheet</td>
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<tr>
<td>1</td>
<td>Interviewee background Current role in the university Previous career in the built environment</td>
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<td>2</td>
<td>Opinion on HBC values Which values attached to the protection of hist. built environment</td>
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<td>3</td>
<td>Built environment professionals and HBC Significance of building conservation knowledge for built environment professionals</td>
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<td>4</td>
<td>HBC in built environment degrees at UK universities Building conservation education practice as part of UK built environment degrees</td>
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<td>5</td>
<td>Opinion on HBC in built environment degrees Participant's opinion on HBC education as part of built environment degrees</td>
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<td>6</td>
<td>Introduction of programme to increase building conservation awareness Potential benefits, issues and requirements with and for introducing a national building conservation education programme</td>
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<td>7</td>
<td>Other building conservation training programmes If not at university, how/where can you learn about building conservation?</td>
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<td>8</td>
<td>Statements Kate Clark – 1/3 of planning application impacts historic environment DCMS - recognition of value of built environment by all who can impact it</td>
</tr>
<tr>
<td>9</td>
<td>Closing Closing statements, final comments Thanks for cooperation</td>
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**INTERVIEW QUESTIONS (researcher’s guide)**

Please note that these questions have not been fully formulated as they serve only as a rough guide for the researcher during semi-structured interviews and may have been presented in different order or wording in response to developments throughout the interviews; includes prompts;

**CORE questions**

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<td>1</td>
<td>1.1 Please explain your role (at your institution)?</td>
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<td>2</td>
<td>2.1 Which types of value you think are generally attached to HBC?</td>
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|   | 2.2 Do you personally attach value to the protection of the historic built environment?  
   | Please elaborate |
| 3 | 3.2 On a scale of 10 (with 10 being very important), how would you rate the significance of basic building conservation know-how for a professional in the UK built environment sector? |
|   | 3.3 Is there a difference between professions? [list of professions]  
   | Can you rank these professions from most likely to have contact with building conservation projects to least likely?  
   | Could you explain your reasons for this ranking?  
   | Can you score each of these professions (out of 10) how likely their contact with building conservation projects is? |
|   | 3.4 In your opinion, does having building conservation know-how have any general influence on employability? |
| 4 | 4.4 Conducted a survey of HE institutions and built environment degrees, which suggests that building conservation education as part of such degrees is not very widespread.  
   | What do you think could be reasons for that?  
   | Busy, uninterested, not relevant to course, curriculum inflexible, no expertise, no resources, right balance of learning outcomes  
   | Which of those reasons do you rate as most influential?  
   | Any of those reasons not particularly important? |
5.1 What is your opinion on including building conservation contents into built environment course curricula?
   - Reasons?
     - Which benefits could be gained from it?
       - for students, the market, the economy, the cultural heritage
     - Which downsides do you see?

5.2 On a scale of 10, how important would you say is it for students to be introduced to basic building conservation know-how as part of their university degree?
   - Could you explain your reasons for this ranking?
   - Differing between courses?

5.3 In your opinion, should the profile of building conservation education be raised in built environment courses in HE?
   - Reasoning?
   - How could the profile be raised?

6.1 Assume the introduction of a national programme to raise building conservation awareness in built environment students (explain programme)
   - Opinions on that?
   - What could be the benefits?
   - Which problems can you see?
     - Practical application, acceptance, support
   - Which incentives could increase the acceptance of building conservation education?
     - Resources, time, accreditation, expert advice, teacher training, prof recognition

6.2 Can you think of criteria which would have to be fulfilled to increase acceptance of such a programme?
   - Prof accreditation/support, prof. recognition, quality assurance, positive student experience, CV building

7.1 Are you aware of any external bodies promoting the building of basic conservation know-how as part of undergrad built environment degrees?

7.2 If not taught at university, how do new professionals gain building conservation experience? [except practitioners]

7.3 Are you aware of any building conservation training programmes outside of universities?
   - If so, which ones?
   - Organised by?
   - Have you had any personal experience with such a training programme?
     - If so, which?
     - If so, how would you rate that experience?
     - Impact on your work?
   - If not, have you heard any second-hand accounts of such training programmes?
Statement 1: 
Around a third of all planning applications per year potentially impact the built heritage.

Kate Clark, *Planning for the past: Heritage services in local planning authorities in England* (2001, p. 63)

8.1 What is your opinion on this statement? 
Is the estimate justified? Why (not)?

Statement 2: 
Aspire ‘that the value of the historic environment is recognised by all who have the power to shape it’


8.2 What is your opinion on this statement? 
8.3 How do you think this statement relates to the previous one? 
8.4 How do you think these two statements relate to the education of built environment professionals (in universities)?

9.1 Is there anything else you would like to say on the topic of building conservation education that has not been covered in this interview? 
Thank you very much for your cooperation.

---

**VARIABLE questions - EDUCATORS**

1.2 How many courses – which ones? 
Which subjects taught 
Professional background 
Work experience 
in the UK built environment sector or abroad?

3.1 Did you encounter any projects involving sensitive conservation aspects in your industry career? (if applicable) 
If yes, were there many? 
If yes, did your company/office have a “conservation project specialist”? 
If no, did your office get help from an external expert?
4.1 Who decides the contents of HE courses?
   Main decision maker?
   Other influences?

4.2 Are there any institution-external influences on course contents?
   Government, boards, accreditation bodies, committees, industry
   If yes, who influences?
   Which form does this influence take?
   Is there pressure to incorporate specific contents?

4.3 How would you rate the impact of a professional accreditation on a course?
   Student numbers, rankings, funding, etc.?

4.5 Are you aware of any conservation-related units in any of the courses you teach on?
   There are [were] three courses – why does only one have HBC unit?

4.6 Been involved in teaching those conservation-related subjects?
   If yes, which one(s)?
   If yes, which format was the teaching?
     Lecture, seminar, case study, field trip...
   If yes, can you remember which topics were covered?

4.7 In the courses you teach on, are you aware that conservation-related issues are being discussed even if there is no dedicated seminar or unit?
   Yes, how frequently? How much detail?
   Who makes decisions on if and how?
## VARIABLE questions - PRACTITIONERS

| 1 | 1.2 Work experience previous to current job?  
   Which job(s)?  
   Responsibilities?  
   in the UK built environment sector or abroad?  
| 1.3 Education?  
   How did you arrive at your current job? [reword] |
|---|---|
| 3 | 3.1 Do you encounter projects involving sensitive conservation aspects in your work?  
   If yes, how frequently?  
   If yes, does your company/office have a “conservation project specialist”?  
   If no, does your office get help from an external expert?  
| 3.5 Does building conservation know-how impact project efficiency for practitioners?  
   Please elaborate  
| 3.6 Can you describe the working relationship between practitioners and conservation regulating bodies such as English Heritage?  
   Are there prejudices/misconceptions/misunderstandings? |
| 4 | 4.1 How did your degree (if applicable) / education prepare you for work with historic buildings?  
   Please describe – which form did that preparation take?  
   Did you feel sufficiently prepared?  
   If yes, please elaborate why  
   If no, how did you acquire the skills and knowledge to work with historic buildings?  
   How do “new” practitioners in general cope with working on a historic building?  
| 4.2 Please describe the importance of a professional accreditation for a practitioner?  
   Impact on employability? Salary?  
   How important is a professional accreditation for a HE degree?  
| 4.4 In your opinion, what is the industry's stance on the level of building conservation education provided as part of built environment degrees in HE?  
(4.4 becomes 4.3) |
| 1.2 Work experience previous to current job?  
   Which job(s)?  
   Responsibilities?  
   in the UK built environment sector or abroad? |
|---|
| 1.3 Education?  
   How did you arrive at your current job? [reword] |

| 3.1 Did you encounter any projects involving sensitive conservation aspects in your industry career? (if applicable)  
   If yes, how frequently?  
   If yes, did your company/office have a “conservation project specialist”?  
   If no, did your office get help from an external expert? |
|---|
| 3.5 Does building conservation know-how impact project efficiency for practitioners?  
   Please elaborate |
| 3.6 Can you describe the working relationship between your organisation and conservation regulating bodies such as English Heritage? |

| 4.1 Please describe the importance of a professional accreditation for a practitioner?  
   Impact on employability? Salary? |
| 4.2 How would you rate the impact of a professional accreditation on a course?  
   Student numbers, rankings, funding, etc.? |
| 4.3 Does your organisation exert influence on course contents for accredited courses?  
   If yes, which form does this influence take?  
   Is there pressure to incorporate specific contents? |
| 4.5 What is your organisation’s stance on the general level of building conservation education provided as part of built environment degrees in HE? |
| 4.6 Does your organisation promote building conservation education?  
   If so, in what form? |

| 6.3 Which criteria would such a programme have to fulfil to be supported by your organisation? |

| (instead of) 7.3 Does your organisation provide building conservation training programmes outside of universities?  
   Please elaborate |
### VARIABLE questions – REGULATORS (Building Conservation)

| 1 | **1.2 Work experience previous to current job?**  
   |   | Which job(s)?  
   |   | Responsibilities?  
   |   | in the UK built environment sector or abroad?  
   | **1.3 Education?**  
   |   | How did you arrive at your current job? [reword] |
| 3 | **3.2 Does building conservation know-how impact project efficiency for practitioners?**  
   |   | Please elaborate  
   | **3.5 Can you describe the working relationship between your organisation and the planning and construction industry?**  
   |   | What are the main difficulties?  
   |   | Common conceptions/misconceptions about building conservation?  
   |   | Areas in which cooperation is good/improving? |
| 4 | **4.1 Your organisation is active in educating people about the historic built environment. Can you please describe your key educational aims and strategies?**  
   |   | Which target groups?  
   |   | Why (no) students?  
   | **4.2 Does your organisation exert influence on course contents for accredited courses?**  
   |   | If yes, which form does this influence take?  
   |   | Is there pressure to incorporate specific contents?  
   | **4.3 Does your organisation promote building conservation education in HE?**  
   |   | If so, in what form?  
   |   | In non-specialist courses?  
   |   | Please elaborate  
   | **4.5 What is your organisation’s stance on the general level of building conservation education provided as part of built environment degrees in HE?** |
| 6 | **6.3 Which criteria would such a programme have to fulfil to be supported by your organisation?** |
| 7 | **(instead of) 7.3 Which building conservation training programmes are provided by your organisation for professionals outside of universities?**  
   |   | Please elaborate |
Participant received a list of professions to rank and copies of the two statements:

PROPERTY DEVELOPMENT
PROPERTY DEVELOPMENT & QUANTITY SURVEYING

PROPERTY MANAGEMENT/MARKETING

BUILDING STUDIES

BUILDING SURVEYING

CONSTRUCTION MANAGEMENT

QUANTITY SURVEYING

REAL ESTATE
REAL ESTATE AGENCY/ MANAGEMENT

Statement 1:
Around a third of all planning applications per year potentially impact the built heritage.

Kate Clark, Planning for the past: Heritage services in local planning authorities in England (2001, p. 63)

Statement 2:
Aspire ‘that the value of the historic environment is recognised by all who have the power to shape it’