

THE STANDING OF HANDS-ON LEARNING IN EDUCATION

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Date Received: 15/09/2017

Date Revised: 02/01/2018

Date Accepted: 23/01/2018

ABSTRACT

The article reports a research that reviewed the history and content of technical related subjects in order to consider the educational areas that have caused scepticism and the creation of stigma. A literary research was undertaken to identify issues. Subsequently, the authors firstly questioned the general public in order to assess their opinions; and secondly students, to achieve their academic capability and personal experiences of stigma. The stigma was found to be grounded around the achievement of practical skills which, due to the poor or limited interaction people have had during their education at a young age, was believed to encompass.

Keywords: Stigma, Design and Technology, Education, Practical Skill, Hands On.

INTRODUCTION

The Stigma of Design and Technology suggests that DT pupils were those who struggled with academic subjects and had found an easier path through education; "The best sixth form students are persuaded to take courses in the arts and sciences, while those who do not show much prosperity for intellectual study are relegated to the craft courses" (Glenister, 1968, p. 63).

The basis for the evolution of this stigma was always unknown. Was it an outdated opinion passed down from parents or grandparents? Was it the snobbery of independent schools frowning upon this modern subject? Was there a genuine truth to what was being suggested; are DT students less academically able and have found an easier path through higher education?

In order to divulge the problem at hand in accessing if DT carries a stigma, we must develop an understanding of this topic area and define the meaning of stigma. Fischhoff (2001, p. 34) suggests that, "Settling on a restrictive definition is inherently controversial. It will conflict with the definitions held by some investigators. It might even exclude some of those investigators from the community of stigma." With this comment in mind, the following definitions have been chosen as offering the clearest most consistent basis to work from.

Crocker et al., (1998, p. 1) explains that;

'Stigmatisation, at its essence, is a challenge to one's humanity-for both the stigmatised person and the stigmatiser. Stigmatisation involves dehumanisation, threat, aversion, and sometimes the depersonalisation of others into stereotypic caricatures. The statement is supported by Dovidio et al. (2003, p. 504) in the explanation that; 'A person who is stigmatised is a person whose social identity, or membership in some social category, calls into question his or her full humanity- the person is devalued, spoiled, or flawed in the eyes of others.'

Both sources recognise the threat on the humanity of the stigmatised individual; by questioning the humanity of an individual this raises the issue of human rights and calls into question the entitlement anyone has to do this. When dealing with brandishing a person with the words 'spoiled' or 'flawed' you are suggesting quite strong language that can be personally very costly. Certainly in the case of education to suggest that a pupil is defected because, perhaps unknown to them, they are studying and succeeding at a subject only considered second rate in the eyes of most people, could be highly damaging to a pupil's confidence.

Fischhoff (2001, p. 2) offers a more simplified and focused definition; 'Stigma is demonstrated by principal refusal to engage in an act that would otherwise be acceptable'.

Whereas Fischhoff's definition describes the actions taken by a perceiver, the two previous offerings comment on what it means to stigmatise a person. Fischhoff's definition can be applied to numerous situations, as primarily stigma can be the refusal to interact with a place or a product, for example, as well as a certain act. So in this sense, the word 'act' in Fischhoff's definition can be interchanged with the appropriate word to suit a given situation. For the purpose of this investigation, the three definitions cover both the stigmatisation of firstly the DT student and secondly, with Fischhoff's definition, the subject of DT. In the following passage, the author will look at the process of stigma application and the identification of stigma.

1. The Application of Stigma

Fischhoff's (2001) 'general model of stigma and stigma related avoidance' (Figure 1) indicates the complexity of arriving at the notion of stigmatic avoidance when there has been an 'event' that brings into question a person's reaction. This includes the:

- Perceiver has witnessed an 'event' and has installed a stigma.
- Others' stigmatic avoidance.
- Stigmatic avoidance may be confirmed or prompted by observing others avoidance of the same event.
- Risks and benefits associated with the initiating event, could turn into stigma.
- Avoidance behaviour but not for stigmatic reasons.
- Risks and benefit recognised, but assessment has revealed no quantifiable reasoning behind risk.

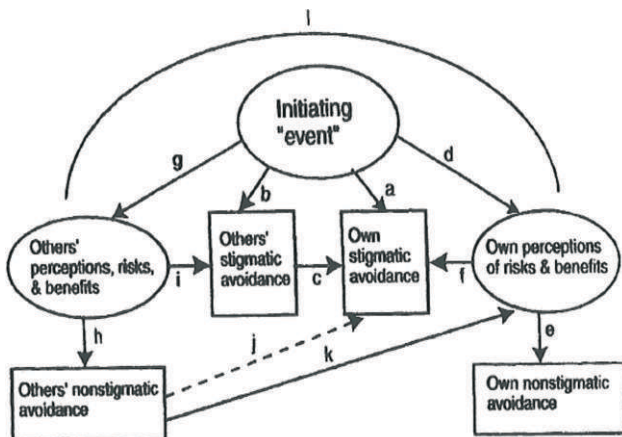


Figure 1. Fichhoff's General Model of Stigma and Stigma Related Avoidance

- Others' risks and benefits associated with the initiating event, which could turn into stigma.
- Others' avoidance behaviour but not for stigmatic reasons.
- Others' risks and benefit recognised, but assessment has revealed no quantifiable reasoning behind risk.
- Others' non-stigmatic avoidance interpreted as stigmatic avoidance by perceivers.
- Others' non-stigmatic avoidance influences perceivers risks and benefits.
- Perception of risks and benefits can be influenced by others.

2. Identifying Stigma

We must now consider how it is that we identify the key aspects of stigma. The authors' initial understanding is that to differentiate between stigmatic and non-stigmatic is very ambiguous, and that a definitive answer will be extremely difficult to locate, as the stigmatic rulings to a given 'event' will alter with varying perceivers.

Walker (2001) introduces four community-based notions responsible for identifying stigma:

- There must be communication.
- The communication occurs through a marker.
- This marker is associated or attached to a person /place/product/ industry.
- Perception of the marker triggers a negative affective response or avoidance behaviour in the perceiver.

Walker does suggest however that these four characteristics cannot always apply to the phenomena we call stigma, as for example, a skull and crossbones on a bottle of poisonous chemical fits the above criteria, but does clearly have quantifiable risk and cannot be classified as stigma. Walker has therefore suggested two further characteristics in the identification of a stigma in an attempt to clarify and exclude any uncertainty as to whether a marker represents stigmatic or non-stigmatic avoidance.

1. The effectiveness of the communication derives from a negative affective response that originally occurred in some other context, and which has been transferred to a

new context; there is transference of this negative affective response by means of a marker (Walker, 2001, p. 354). (The communication regarding the new context, originated in relation to another event, and has now been translated via a common denominator to the new event).

2. The degree of negative affective response that the marker generates is not fully explained by real risk (Walker, 2001, p. 354).

This is the most crucial aspect of the six characteristics addressed, as the crucial difference between a real risk and stigma is the irrational reasoning. The example of the skull and crossbones cannot now be classified under the six characteristics, as the 'risk' recognised by the symbol is rational.

3. What is Design and Technology?

In order to understand why people apply a stigma to DT and its students, it is necessary to determine the various areas of the subject and what is involved in its study. This section will therefore define:

1. What is Design and Technology?
2. What are the key objectives of the subject?

Introduced in 1988 as the replacement for CDT, DT is now a compulsory subject for children from the age of 4-5 up to the age 16 in England, and up to 14 in Wales. There is also a strong suggestion that many independent schools are following this example.

"Design and Technology is unique in the school curriculum, and is the only subject concerned with a pupil's ability to design and make, to solve problems with the use of materials and to understand the significance of Technology." Eggleston (1996, p. 23). Miliband (2004, p. 1) MP, the Minister of State for School Standards furthermore states: Design and Technology prepares pupils to think, and intervene creatively to improve the quality of life. The subject calls for pupils to become autonomous and creative problem solvers, as individuals and as members of a team. The processes which are central to design and technology require pupils to integrate knowledge, skills, and understanding whilst working with materials in order to design and make solutions to needs, wants, and opportunities.

4. The Objectives of Design and Technology

To begin to evaluate the objectives of DT in detail, it is simplest to refer to the 1992 National Curriculum attainment targets. During each attainment level, pupils should show progression in the following aspects:

4.1 Identifying Needs and Opportunities

Pupils should be able to identify and state clearly needs and opportunities for design and technological activities through investigation of the contexts of home, school, recreation, community, business, and industry.

4.2 Generating a Design

Pupils should be able to generate a design specification, explore ideas to produce a design proposal, and develop it into a realistic, appropriate, and achievable design.

4.3 Planning and Making

Pupils should be able to make artefacts, systems and environments, preparing, and working to a plan and identifying, managing and using appropriate resources, including knowledge and processes.

4.4 Evaluating

Pupils should be able to develop, communicate, and act upon an evaluation of the processes, products, and effects of their design and technological activities (National Curriculum Council, 1990, p. 3-11).

The National Curriculum 2007 retains the attainment targets as in 1992, but they have evolved into just three areas of focus that must be covered at each level: Note: Knowledge and understanding supports attainment in these three areas:

- Developing, planning, and communicating ideas.
- Working with tools, equipment, materials, and components to make quality products.
- Evaluating processes and products (National Curriculum in Action- Design and Technology Level Descriptions, 2007, pp. 1-3).

The Department for Education and Skills 2007 suggests six key areas that must be covered during each attainment target level:

1. Exploring ideas and the task
2. Generating ideas

3. Developing ideas
4. Planning
5. Evaluating
6. Making high quality products

Eggleston (1996, p. 24) states, "Design and Technology has two components- 'Design' and 'Technology' in close relationship. It consists in using technology to achieve solutions that satisfy sound design criteria and using design to achieve solutions that satisfy sound technological criteria." The integration between the two areas was best seen in the Order for National Curriculum Technology, where similar to the key areas of the attainment targets in 1992 and 2007, it required that DT encompass the following six areas at each key stage to enhance capability in the subject:

1. A broad range of practical activities; in each key stage, pupils should design and make: artefacts, systems, and environments in response to needs and opportunities identified.
2. Five broad contexts of work, home, school, recreation, community, business, and industry.
3. Working with a broad range of materials; including textiles, graphic media, construction materials, and food.
4. A breadth of knowledge, skills, understanding, attitudes, and values required in the programmes of study, pupils should be taught to draw on their knowledge and skills acquired from other subjects, particularly Maths, Science, and Art.
5. Personal Development through activities in Design and Technology; pupils should be taught to discuss their ideas, plans, and progress with each other and should work individually and in groups. They should also be taught to take care at all times, of themselves and of others.
6. Progression of Individual Capability; as pupils progress they should be given more opportunities to identify their own tasks for activity, and should use their skills/ knowledge to make products that are more complex (Walker, 2001, p. 354).

5. The Origins of Design and Technology

It was recognized in Fischhoff's (2001) general model of stigma, that your own stigmatic avoidance could be

initiated by observing the reaction of others' to a prescribed event, in this case, DT and the pupils of the subject. With this in mind, the influence of previous generations' perception of DT could be very significant in the identification of stigma. A pupil considering studying DT at A level for example, might well be persuaded otherwise due to the irrational and outdated opinions of his father or grandfather, resulting in stigma related avoidance. By discussing and investigating the origins of DT in Britain, the authors hope to be able to encapsulate the objectives of the subject in its infancy, as well as highlight areas of vulnerability in regards to stigma.

5.1. Design and Technology is born

Forster (1870) introducing the first reading in the 1870 Education Bill, informed the House of Commons that, industrial supremacy depended on the steady provision of elementary education. Forster was trying to indicate the significance of education from a young age, as opposed to trying to educate artisans, who were in a vast number of cases, uneducated and incapable of taking on board new skills. His appeals went largely ignored and Britain's performance as an industrial nation slipped into the second division. Playfair, (1867) an MP believed he had identified the reason for Britain's languishing industrial performance: a lack of technical instruction. He argued that within these solid brick buildings, the curriculum was almost entirely literary and its irrelevance to the country's industrial needed became a constant cause of criticism (Penfold, 1988). Huxley (1878), scientist and school board member, declared that relying purely on bookishness would lead to the mischievous delusion that brainwork in itself is a nobler and more respectable thing than handiwork. In 1881, the Royal Commission on Technical Instruction was founded with the intention of inquiring into the industrial classes of foreign countries and to evaluate the impact such training is having on manufacturing and industry (Dyke, 1882). This marked a positive step for Britain in the creation of manual instruction in elementary schools. However, the debate regarding the content and intentions of the subject was to continue for a further seven years before its introduction into the education system. Dyke (1882), Vice President of the Committee of Council of Education attempted eight times to introduce Industrial

Training before it was finally accepted into the Statute Book in 1889.

5.2 Society's Reaction to the New Subject

The early signs for Industrial Instruction were positive, with the Royal Commission paying close attention to the successes of foreign examples, and the Victorian social ethic that rigorous labour-intensive training was proposed to lead to an improvement in moral behaviour (Forss, 1835), the subjects' future had promise. Dyke (1882, p. 23), introducing his second Technical Instruction Bill, explains the objectives and principles of manual instruction with the intention of benefitting all parties involved: "Elementary technical instruction should not be seen as a form of trade training but, rather as affording pupils training of the eye and the hand...and by that means giving the greater facilities for acquiring a trade."

This promising proposal was supported by that of Moss (1884, p. 5), Clerk to the Sheffield School Board, speaking at the International Health Exhibition in 1884: "School workshops should have a much wider aim than that of mere amusement, or even the teaching of young people ...it should supply a connecting link- practical in its bearing, and thoroughly educational in its character- between theoretical knowledge and the industrial pursuits in which they may be applied. It should have a means of illustrating scientific principles and of applying in practice theories."

In addition to Moss (1884) statement, the following quotation from The School Master (1882, p. 35) regards the tradesman with the utmost respect as well as the role of manual instruction in the education system: "The man who is really the master of a trade is a liberally educated man. He must possess at least knowledge of the uses and properties of the materials upon which he works...in addition he must possess a high degree of manual dexterity- these acquisitions imply a good many more- they imply intellectual development and even cultivation of taste."

The indications from the people in power were that the subject would provide pupils with a wider range of skills and qualities enabling them to embrace this new industrial age. However, the drive to implement manual training was met with much resistance from the working classes, trade

unions, and more surprisingly, school boards. The school boards were more concerned with pressing current affairs and did not support this experimental new subject offering little support. The industrial revolution offered a great demand for introduction of metalworking facilities, but these were expensive and the majority of schools avoided the use of valuable resources to implement this untried new subject, instead introducing cheaper wood working facilities.

The working classes viewed this new pioneering subject unfavourably and saw it as a "subservient role for the working classes" (Penfold, 1988, p. 3) associating the learning of manual skills with pauper training. Mundella (1884, p. 23), MP, at the Health Education Conference in 1884 stated, "The great thing is to show the working classes the real dignity of labour...it is far nobler thing to be a good joiner or engineer than a poor clerk." Although Mundella (1884) makes a valid point in regards to the demand for manual intensive workers and commends the skill level involved in engineering or joining, as opposed to the oversubscribed academic roles. He still suggests that it is the responsibility of the working classes to fill these 'dignified' positions as engineers and joiners. Magnus a member of the Royal Commission on Technical Education was a great advocate for technical instruction. His intentions however, as clearly stated in his paper 'Problems in Technical Education,' were not to broaden the educational experience for pupils, but to merely prepare them for industrial employment. Penfold (1988, p. 8) states: "Magnus moved astutely towards his objective, which was to gear the education system towards the needs of industry ...intended to be a preparation for future industrial employment".

Driven by the suggested reforming value of manual training that was implicit in Victorian society, the penal system was not helping support the objectives put forward by the education council. Magistrates would send truanting pupils from elementary schools to industrial schools. Stanley (1881, p. 6) stated, "The industrial schools had hitherto been treated by the law as something growing out of the prison and not the education system". The opinions of men such as Forss (1835, p. 23) only fuelled this belief stating, "Manual labour and moral training give an impulse to industrious

habits...I have watched the influence such training has had on the most degraded of society" and unfortunately, this belief was echoed throughout Victorian society.

5.3 Examining DT; The Pursuit of Acceptance

The refusal to accept a subject which focused on the acquisition of practical skills and creativity forced the search for acceptance after decades of battling with society's traditions. Stigma had played a vital role in the formation of a rash and uncompromising change to examining the subject in the search to appeal to the more academic students and reduce stigmatic avoidance. Unfortunately the effect may have been the opposite. The subject had adopted examinations with the intention of reforming society's perceptions; however it was now evident that the subject's outdated content focusing on the practical skills of wood and metalwork, was the area under close scrutiny.

6. Methodology

The aim of the research was to gain an understanding of stigma and the subject of Design and Technology past and present, in order to identify how and why the subject and its students have often attracted stigmatisation. The research used both qualitative and quantitative methods in the form of interviews and questionnaires.

6.1 Objectives of Investigation

- To gain an understanding of stigma, how it is identified and applied to a prescribed event.
- To investigate the historical background and intentions of DT, and how it was received by society.
- To identify what is involved in the study of DT.
- To establish the current academic abilities of the DT student and their reasoning for studying the subject.
- To establish the perceptions of the general public towards DT.
- To evaluate the acquired knowledge and assess what has contributed to the formation of a stigma.

6.2 Quantitative Research

"In natural sciences and social sciences, quantitative research is the systematic scientific investigation of quantitative properties and phenomena and their relationships. The objective of quantitative research is to

develop and employ mathematical models, theories, and hypothesis pertaining to natural phenomena (Given, 2008). The process of measurement is central as it provides the link between empirical observation and mathematical expression of quantitative relationships" (Wikipedia, 2006, p. 7).

Bryman (1993, p. 23) highlights that "quantitative research neglects the role of change in social life, and rarely examines the processes that link variables...This allows the qualitative researcher greater opportunity to research processes in social life."

Although there is a clear distinction between both quantitative and qualitative investigation, it has been suggested that the two go hand in hand. Kardorff (2004, p.7) argues that qualitative and quantitative approaches are complimentary as opposed to competitive. "Use of a particular method...must rather be based on the nature of the actual problem in hand" (Kardorff, 2004, p. 7).

6.3 Qualitative Research

"Qualitative research involves an in depth understanding of human behaviour and the reasons that govern human behaviour. Unlike quantitative research, qualitative relies on reasons behind various aspects of behaviour, simply put it investigates the why and how of decision making as opposed to the what, where, and when of quantitative research. Hence the need for smaller, more focused samples rather than large random samples." (Wikipedia, 2006).

Burgess (1984) argues that qualitative research approaches are preferred to quantitative in social research, as their focus of interest is the way in which different people experience and interpret their lives. Denzin and Lincoln (1994) argue that qualitative research is multi method research that uses an interpretive, naturalistic approach to its subject matter. Qualitative research emphasizes qualities of entities, the processes and meanings that occur naturally (Denzin and Lincoln, 2000). It addresses questions about how social experience is created and given meaning (Denzin and Lincoln, 2000). It provides a narrative of people's view(s) of reality and it relies on words and talk to create texts (Gephart, 2004). Beyond this, qualitative research is particularly hard to pin down because of its flexibility and emergent character. It is often

designed at the same time it is being done and moreover it is open to unanticipated events (Maanen, 1998).

7. The Main Results

Since the introduction of the National Curriculum in 1988 to initiate the subjects compulsory study in schools the status of the DT in the education system has improved dramatically. The following results firstly established the ability of the current DT student and also the confidence they have in their subject. Secondly, whether societies regard for DT has risen along with the subjects improving educational status.

The participation of a high number of postgraduates provided an excellent basis for the remainder of the questionnaire, as this meant 38 of the respondents are currently in education and will have accurate and current opinions on the subject. The incompetence of the DT student in regards to academic work is one of the strongest suggestions made concerning DT. For the purpose of this investigation, the analysis of results achieved by DT students provides a reliable means of contrasting the high status foundation subjects with DT.

Of the 77 AS levels achieved in all subjects (excluding DT) by the respondents, 26 of these were A graded and only 11 grades were below a C grade. Although English participation was particularly low from respondents, the technological and scientific content of DT in higher education is reinforced by the high participation in Maths and Science. According to Moss (1884), DT should have a means of illustrating scientific principles and of applying in practice theories.

The A level results from the 38 respondents continue the positive reflection on DT students boasting 73 A-C grades (not including DT) from 79 A levels grades awarded, 25 of which were A grades. Of these, 21 respondents were awarded an A-C grade in Maths, English, or a Science discipline. In addition to this, 33 of the respondents who were awarded an A or B grade in A level DT, also received an A or B grade in a second subject.

All respondents received A* - C grades at GCSE in all three subjects. Of these results, 50 A* - A grades were achieved, and only 10 C grades were achieved, displaying the standard of DT students was extremely high, which certainly

proves their academic ability to doubters.

The results show that just over 73% of respondents were divided between two reasons for studying DT. By highlighting this area, it emphasises the reasoning for studying DT is not as is often perceived, due to the ease of the subject or to avoid 'book work', because as displayed, the DT student today is as academically accomplished as any other. Penfold (1988) highlights society's often acquired opinion and argues that having failed at everything else, they [DT students] were deemed to be good with their hands.

From the results of questions 5 and 6 it could be assumed that the response to this question was fairly predictable; Of the 37 respondents, 70.3% chose against the option to study a more accepted foundation subject at A level in favour of DT. This is an extremely high accolade for DT to take preference over subjects which are arguably the benchmark for academic achievement in society's eyes; the basis for stigmatising this once low status subject is now dwindling. In support of the previous two questions, the 37 responses to this question continue the status DT does more than instruct in practical skills as often envisaged.

The research showed a fairly worrying response that 19 out of 37 people stated that their peers had degraded the status of DT. Of these 19 people the area of criticism was in the perceived lack of academic content. This was recognised earlier in the Origins of DT chapter. Ironically today it is often the case that the practical projects are often the result of much adoration from peers, but at the same time as the evidence suggests, the manual skills involved in their production cause much criticism due to the perceived lack of intelligence required in their production.

The responses from the participants support the earlier suggestion and Penfold's (1988) statement that it is often perceived that practical skills encapsulate the subject, and the acquisition of knowledge in all forms, is overlooked or ignored.

However with regard to the investigation of stigma it is very interesting, as one person stated they felt embarrassed to study the subject and a second person stated their parents were opposed to them studying DT. This has strong indications that negative imagery has been associated

with the subject, and is highly likely to have created a stigma.

The results from questionnaire 2 indicated that the age range who replied to the survey spans over 17 years, resulting in some of the respondents (older than 27) being educated in CDT and giving a wider perspective for the questionnaire (Penfold, 1988). The collection of both Independent and State school educated respondents, as well as the 17% who have been educated in both systems, will hopefully give a well-balanced opinion.

The research shows very interestingly that out of the 30 respondents, 24 had ceased their involvement with DT at school by the age of 16, and, 17 of these had ceased studying the subject before reaching GCSE/ GCEO level stage. This will provide an excellent basis for reviewing their perceptions of DT, as some of the respondents will not have had any involvement with the subject for over a decade, and may have distorted and out-dated perceptions of the subject.

The results reflect extremely well on the subject as a large majority of respondents were positive about their experiences and supported the national curriculum's intentions as a creative and innovative subject as well as skilled and technical. This is supported in question 10 by a surprising response that 48% feel DT is a Science based technical subject. From studying the National Curriculum attainment targets there is limited reference to mathematical and science disciplines, and without this link being made apparent to pupils at a young age, it could lead to a number of misconceptions that the subject is only concerned with purely aesthetics and not the acquisition of technical knowledge. However, this balanced result showed a positive sign. It is highly probable that the response to question 10 is linked closely to the age that the respondent studied the subject to, as at a young age emphasis is paid to the generation of ideas and portrayal of design ideas through graphics.

Some respondents perceive the subject as easy, industrial, irrelevant and in a few cases saw the lessons as 'a chance to do nothing'. These are not the words and perceptions which we wish to associate with DT, as they can be instilled into a person's opinion for many years and emerge as

stigma.

The results displayed that although 60% of respondents felt that DT at a young age offered some educational worth, the remainder felt it merely offered a break from book work and a chance to get your hands dirty. From a point of identifying stigma it is a concern to think that quite irrationally, it is perceived that DT offers no educational worth prior to GCSEs and is merely a break from routine.

It seems very apparent, especially in light of the evidence presented, that it is instilled into many that pursued the subject for a limited time, the aspect which encompasses DT is the acquisition of practical skills and the production of inanimate objects. To leave a pupil with the notion that DT is purely a practical based subject providing a chance to 'get your hands dirty', which it certainly has been in the past, is unacceptable.

The respondents supported the understanding that intelligence can reveal itself in many forms, and as often is the case with creative subjects it is very difficult and subjective to access an item of creative work. The authors feel the real issue here, and one that forced the implementation of examinations in the 1950s, is that to the untrained and naive who have had little involvement with DT or the creative arts, the regard for intelligence involved is often underrated. This notion is supported in question 15 by the response that 23.3% of people based their answer on an assumption.

Although the responses do not indicate, if the respondent stigmatises against DT, the fact that they are aware of and recognise the stigma does suggest that the respondent has come into contact with stigma at some point which as Fischhoff (2001) and Walker (2001) recognise, could result in the transference of stigma.

Conclusion

At the introduction of DT, the subject was immediately put into a debased position due to its direct association with industry demeaning the subject's intentions and only succeeded in convincing society that it was a subject of factory skills, a "subservient role for the working classes," (Penfold, 1988, p. 3). This stigma was further entrenched by the intervention of the penal system, recognising the subject's reformatory values and using industrial schools as

correctional facilities for dysfunctional members of the community.

The subject's intentions had been misinterpreted and pupils did not want to pursue a subject focused around the acquisition of manual skills, due to the association with lower class industrial workers and labelled the subject 'pauper training'. Only after World War II did the change to examining the subject highlight society's negative perception that the subject's content was outdated and offered little academic comparison to the foundation subjects. The subject's stigma was very much based around the practical skills and their perceived educational irrelevance.

This notion is supported today by the general public, although in the minority, people still feel that the acquisition of practical and tool skills are what encompass the subject. DT students supported this notion, stating that many of their peers feel that there is little academic content to the subject. The problem faced is down to the limited study and contact some pupils have with DT, especially at independent schools. Many of the general public perceived DT at a young age as merely a 'break from book work' and 'a chance to get your hands dirty,' and many pupils leave the subject grasping the perception that the production of various inanimate objects using prescribed dimensions and materials is what encompasses the subject. This resulted more importantly, in the misconception and irrational opinion of the lack of academic ability required by DT students, being carried for many years only to reoccur as stigma.

The promised involvement at the Key Stage levels with the highly regarded Maths and Science disciplines are often neglected, leaving the primary educational values focused around practical skills. It is imperative at this early stage, in addition to the exploratory and creative aspects, that students are aware of this connecting link to prevent the initiation of stigmatisation triggered by the subject's perceived simplistic and low academic content for younger pupils.

Penfold suggested (1988, p. 20) that having failed at everything, they were deemed to be good with their hands," indicating the stigmatised situation that faced

pupils of DT in years past. The DT students of today however are not only excelling in a wide variety of subjects, but are choosing against studying the likes of Maths and Physics at A Level, of which they are extremely capable, in favour of DT. The opportunity for society to stigmatise the DT pupil is rapidly diminishing, and as the authors look forward to an increasingly technological age, the subject's status which has risen so dramatically over the last twenty years, only looks set to improve. Hopefully in conducting this investigation it will raise the awareness to the reader who has doubted the abilities of the DT student as well as indicate the challenging and rewarding qualities the modern subject has to offer.

References

- [1]. Bryman, A. (1993). *Quantity and Quality in Social Research*. London: Routledge.
- [2]. Burgess, R. G. (1984). *In the Field: An Introduction to Field Research*. London: George Allen & Unwin.
- [3]. Crocker, J., Major, B., & Steele, C. (1998). Social Stigma. In Heatherton T. F. et al., (Ed.), *The Social Psychology of Stigma*. London: Guildford Press.
- [4]. Denzin, N. K. & Lincoln, Y. S. (1994, 2000). Introduction: Entering the field of qualitative research. In Denzin and Lincoln (Eds.), *Handbook of Qualitative Research*. Cited in: Gephart, R. (2004). What is Qualitative Research and Why is it important? *Academy of Management Journal*, 47(4).
- [5]. Dovidio, J. F., Major, B., Crocker, J. (2003). Stigma: Introduction and Overview. In Heatherton T. F. et al., (Eds.), *The Social Psychology of Stigma*. London: Guilford Press.
- [6]. Dyke, W. (1882). Second Report of the Royal Commission on Technical Instruction. In Penfold, J. (Eds.), *Craft, Design and Technology: Past, Present and Future*. Stoke-On-Trent: Trentham.
- [7]. Eggleston, J. (1996). *Teaching Design and Technology*, 2nd Ed. Buckingham: Open University Press.
- [8]. Fischhoff, B. (2001). Defining Stigma. In Flynn, J., Slovic, P., & Kunreuther, H. Eds., *Risk, Media and Stigma: Understanding Public Challenges to Modern Science and Technology*. London: Earthscan Publications.
- [9]. Forss, C. (1835). Practical Remarks upon the Education of the Working Classes. In Penfold, J. (Eds.), *Craft, Design*

and Technology: Past, Present and Future. Stoke-On- Trent: Trentham.

[10]. Forster, W. E. (1870). Hansards Parliamentary Debates. In Penfold, J. (Eds.), *Craft, Design and Technology: Past, Present and Future*. Stoke-On-Trent: Trentham.

[11]. Gephart, R. (2004). What is Qualitative Research and Why is it important? *Academy of Management Journal*, 47(4), 454-462.

[12]. Given, L. M. (2008). *The Sage Encyclopaedia of Qualitative Research Methods*. Los Angeles. Calif.: Sage Publications.

[13]. Glenister, S. H. (1968). *The Technique of Craft Teaching (Woodwork and Metalwork)* 3rd Ed. London: George G. Harrap.

[14]. Huxley, T. (1878). Technical Education. The Fortnightly Review 23. In Penfold, J. (Eds.), *Craft, Design and Technology: Past, Present and Future*. Stoke-On-Trent: Trentham.

[15]. Kardorff, E. V. (2004). *A Companion to Qualitative Research*. London: Sage Publications.

[16]. Maanen, V. (1998). Cited in: Gephart, R. (2004). What is Qualitative Research and Why is it important? *Academy of Management Journal*, 47(4), 454-462.

[17]. Milliband, D. (2004). *Design and Technology: Framework and Training Materials* (Foreword). Retrieved from <http://www.standards.dfes.gov.uk/secondary/keystage3/respub/design/foreword/> (19 March 2017).

[18]. Moss, J. F. (1884). The value of special and general workshop instruction in elementary, higher and evening schools, International Health Exhibition (Presentation). In Penfold, J. (Eds.), *Craft, Design and Technology: Past, Present and Future*. Stoke-On- Trent: Trentham.

[19]. Mundella, A. J. (1884). Technical Teaching, The Health Education Literature, 14. In Penfold, J. (Eds.), *Craft, Design and Technology: Past, Present and Future*. Stoke-On- Trent:

Trentham.

[20]. National Curriculum Council (NCC). (1990). *Technology in The National Curriculum*. New York: National Curriculum Council.

[21]. National Curriculum in Design, Craft and Technology Level Descriptions. (1988). Retrieved from <http://www.nc.action.org.uk/subjects/design/levels.htm>

[22]. National Curriculum in Action- Design and Technology Level Descriptions. (2007). Retrieved 30/12/2017 from: <http://www.nc.action.org.uk/subjects/design/levels.htm>

[23]. Penfold, J. (1988). *Craft, Design and Technology: Past, Present and Future*. Stoke-On- Trent: Trentham.

[24]. Penfold, J. (1988). The Industrial Origins of School Workshop Subjects. In: *Craft, Design and Technology: Past, Present and Future*. Stoke-On-Trent: Trentham.

[25]. Playfair, L. (1867). Journal of the Society of Arts. In Penfold, J. (Eds.), *Craft, Design and Technology: Past, Present and Future*. Stoke-On-Trent: Trentham.

[26]. Qualitative Research (2006). In *Wikipedia*. Retrieved from http://en.wikipedia.org/wiki/Qualitative_method (15 March 2017).

[27]. Stanley, E. I. (1881). Industrial Schools and the Home Office. The Fortnightly Review, 10. In Penfold, J. (Eds.), *Craft, Design and Technology: Past, Present and Future*. Stoke-On-Trent: Trentham.

[28]. The School Master. (1882). Progress of Technical Education. In Penfold, J. (Eds.), *Craft, Design and Technology: Past, Present and Future*. Stoke-On-Trent: Trentham.

[29]. Walker, V. R. (2001). Defining and Identifying Stigma. In Flynn, J., Slovic, P., & Kunreuther, H. (Eds.), *Risk, Media and Stigma, Understanding Public Challenges to Modern Science and Technology*. London: Earthscan Publications.

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