ACHIEVEMENTS OF TECHNOLOGY SUBJECT IN DEVELOPED FOREIGN COUNTRIES

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Abstract

This article shows the activities taught in foreign countries and their achievements in the lessons of subject Technological education at school. The types of training performed in schools in Switzerland, New Zealand, England and their advantages are covered.

Keywords: Design and technology, practice, service, pedagogical, new technologies, designers and engineers.

Introduction

The subject of technology taught in schools of the Republic of Uzbekistan is called "design and technology" in some developed countries. For example this is the case in English schools. Design and Technology (D&T) is taught in most primary (for children aged 1 to 5) and secondary schools (for children aged 11 to 16) in England. New themes in this subject came mainly from craft pineapples and domestic work skills. For the development of Science, the emphasis is placed on covering topics that are more focused on the formation of students ' design and practical performance skills. When creating designs and projects for the development of subject in schools - such areas as electronics, metal, plastic, textiles and wood are included. However, in England it is considered important to teach about technological developments. This creates its own problems, since in some schools new and developing technologies are not available for use by students in design and production. Often conducting theoretical lessons can negatively affect the development of subject.

The main part

Often theoretical classes are used to familiarize students with materials and technologies. Lessons are usually not related to a design competition because (understandably) the focus is on students learning and preserving facts so they can

pass exams; but it's not the only one (or the best one) It is a way of teaching students, and it is known that in D&T students are introduced to materials and technologies so that they can take exams. they can make informed decisions about their designs and make judgments about the work of other designers.

In the subject of "Design and technology", practical training is mainly conducted in the following areas:

1. Vocational Engineering- At the production and welding classes, such knowledge as the manufacture of products using a welding machine, metal processing on a lathe, connection of electronic devices and maintenance of technical machines are studied.

Figure 1. Vocational Engineering

2. D&T Product Design- Allows students to design and create creative products to solve life problems and meet design needs. He teaches the historical, social, cultural, environmental and economic impact on design and technology and applies the knowledge gained in practice in the design and production of products. To develop their innovative and creative product, they will learn how to apply their design and production skills. Various materials and technological processes are used to produce high-quality products. Thinking as a designer explains how one can view life in terms of design problems and solutions and apply product design in the real world.
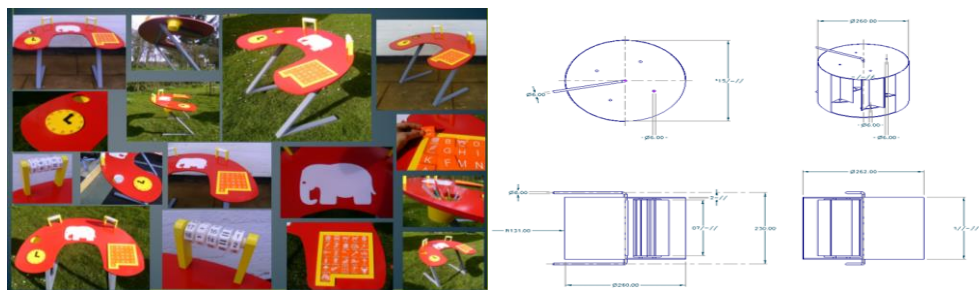

Figure 2. Creating a model of the equipment being prepared

Figure 3. Making equipment using various products

3.   D&T Food Technology- the application of food science to the selection, preservation, processing, packaging, distribution, and use of safe food. Britain's economy: food and drink industry is the largest sector of manufacturing activity, employing 400,000 workers, 16% of the manufacturing workforce. If pupils do not study food science and technology in school it is unlikely they will study it at higher education levels. There are too few graduates to meet industry demands.

Conceptual Framework for food technology
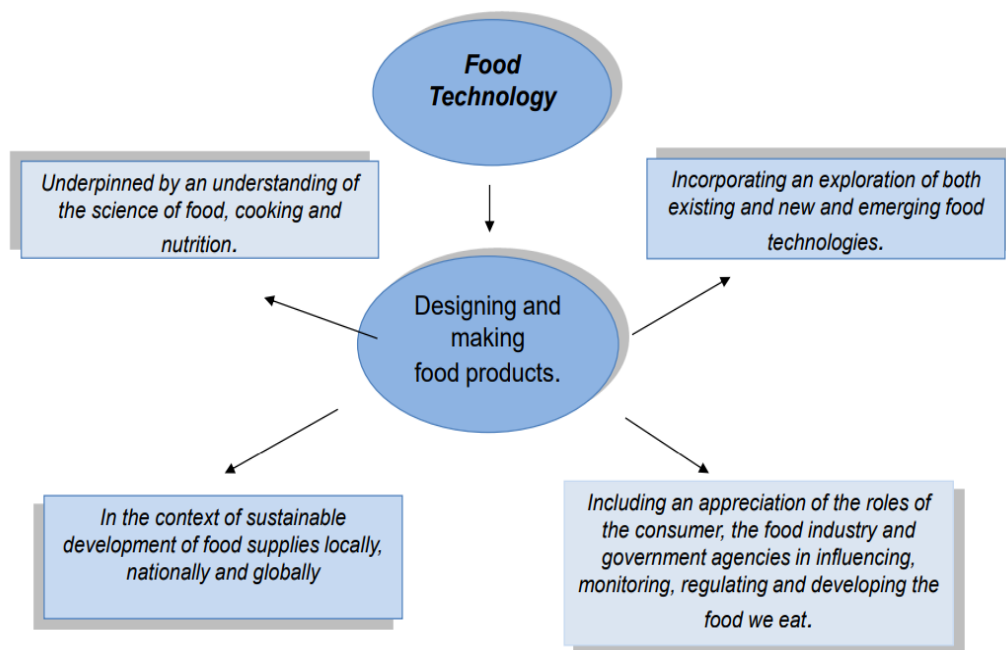
Practical work could be developed so that it can support pupils' learning not only of practical skills but also of food science and nutrition, food sustainability issues and food product development.

Sources of food: animal; plant; fungi; synthetic foods; genetically modified foods; sustainability.

Sensory properties of foods: flavour, ordour; colour, texture and appearance.

Preparation and cooking of foods: choice of ingredients for desired characteristics (e.g. shortening); structure of foods - colloidal systems (e.g. sols, gels, emulsions, foams); raising agents e.g. yeast, chemicals; use of heat transfer (e.g. radiation, convection, conduction).

Nutritional properties: energy; role of fats and ails, carbohydrates, proteins, vitamins and minerals, water; human dietary needs, digestion & absorption; additives and functional food.

Enduring ideas or timeless concepts for the teaching of food technology

Preservation of foods to prevent spoilage: food spoilage caused by yeasts, moulds, and bacteria; preservation foods (e.g. chilling, freezing, canning, dehydration, UHT, irradiation, modified atmosphere packaging); food safety (food poisoning, hygiene and cross contamination).

Chemical & functional properties of foods: changes that take place during preparation and cooking (e.g. gelatinisation, coagulation, caramalisation, mallard reaction, emulsification, fermentation, antioxidants); enzymatic changes (bread, cheese, brewing) .

Manufacturing and large scale production: commercial food production methods (e.g. job/craft, batch, mass, continuous flow, CAM, quality control); food handling in the food industry (HACCP, food safety and the law); modern food processing (e.g. nanotechnology); consumer laws; packaging.
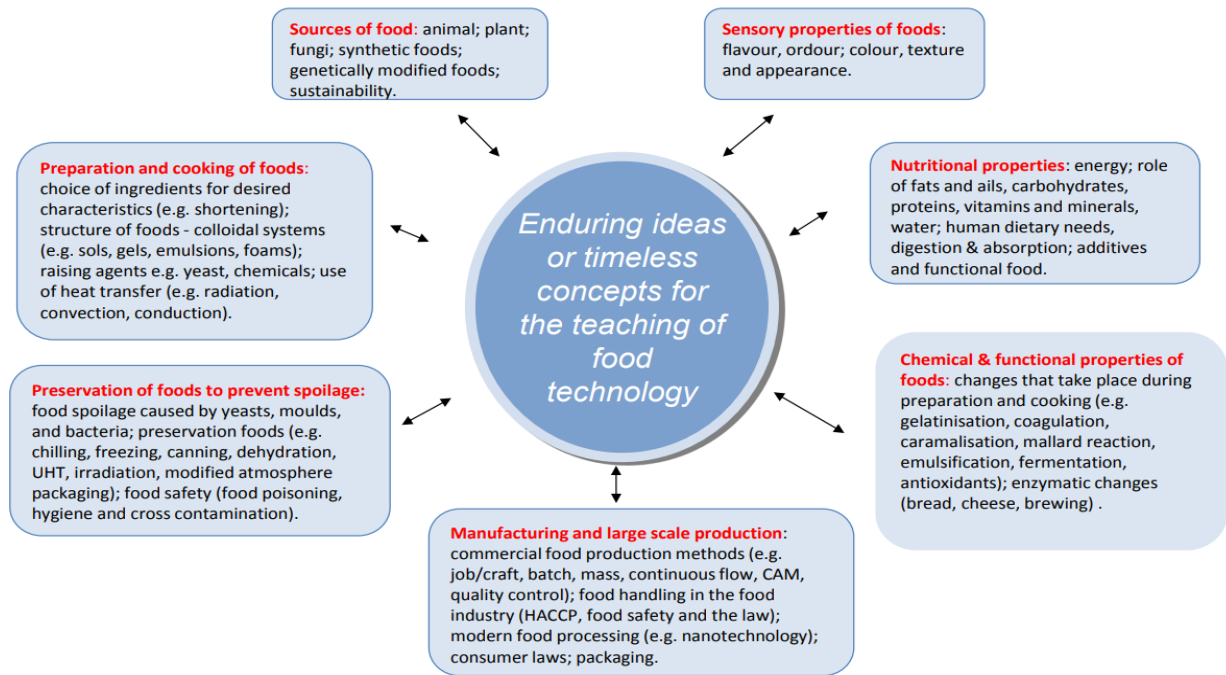

Figure 4. Technological development of cooking.

4. D&T Textiles Technology- provides opportunities for you to work as individuals or as part of a team on projects such as, Fashion, Interior design, client-based design projects, costume and children's toys.


Figure 5. Modern textile products and technologies.

5.   D&T Systems & Control- theory has played a vital role in the advance of engineering and science.The automatic control has become an integral part of modern manufacturing and industrial processes. For example, numerical control of machine tools in manufacturing industries, controlling pressure, temperature, humidity, viscosity and flow in the process industry.

Let us study about a new type of engineering study which is called as **Control Systems Engineering**. It's very interesting subject and has a lot of calculation part.Control system theory evolved as an engineering discipline and due to the universality of the principles involved, it is extended to various fields like economy, sociology, biology, medicine etc.

Control systems are of two types. They are

1) Open Loop System

2) Closed Loop System
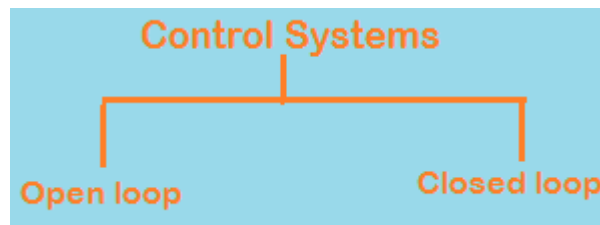
Advantages of Open loop control system:

1.The **open loop systems** are simple and economical.

2.The open loop systems are easier to construct.

3.Generally, the **open loop systems** are stable.

Disadvantages of open loop systems:

1.The **open loop systems** are inaccurate and unreliable.

2..The changes in the output due to external disturbances are not corrected automatically.

Advantages of closed loop systems:

1.The **closed loop systems** are accurate.

2.The closed loop systems are accurate even in the presence of non-linearities.

3.The sensitivity of the systems may be made small to make the system more stable.

4.The closed loop systems are less affected by noise.

Disadvantages of closed loop systems:

1.The **closed loop systems** are complex and costly.

2.The feedback in closed loop system may lead to an oscillatory response.

3.The feedback reduces the overall gain of the system.

4.Stability is a major problem in closed loop system and more care is needed to design a stable **closed loop system**.
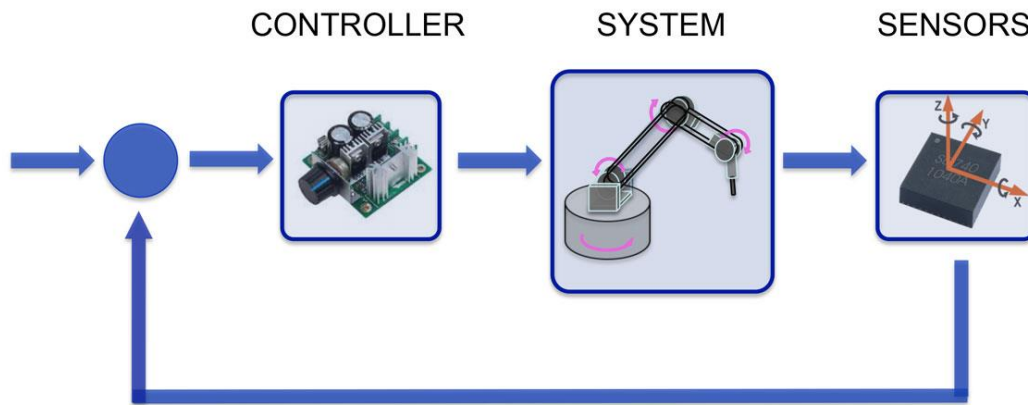

Figure 5. The principle of operation of the simplest "D&T Systems & Control". Students who receive knowledge to acquire this knowledge are distributed by gender as follows.
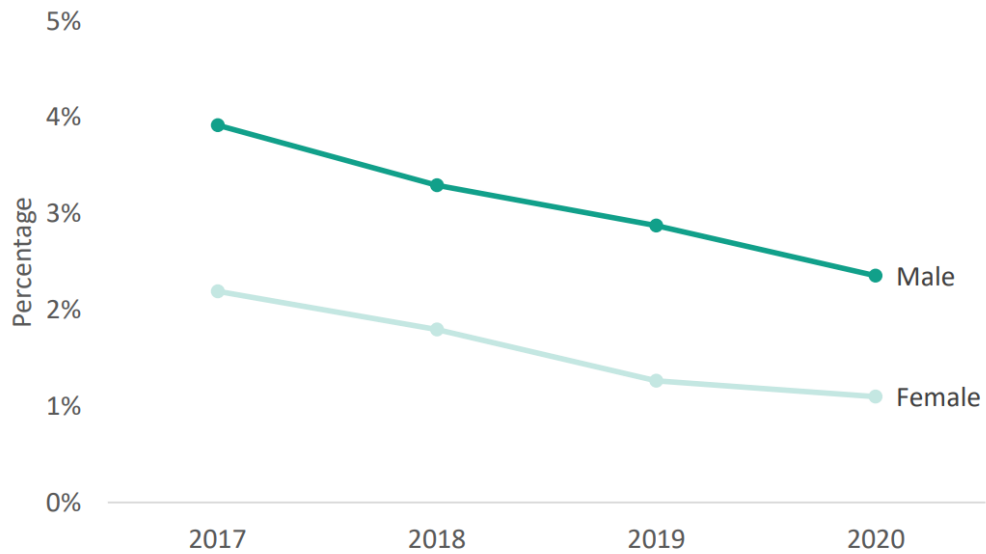

Figure 1. The figure of admission to higher education institutions of all graduates of schools in England by gender for the course "Design and technology".

This means that in England, boys' interest in the subject of "design and technology" is higher.

Conclusion

New technologies could be taught as a theory lesson, evaluating existing products or abstract ideas from an unimaginable world. Instead, design fiction as a pedagogical approach offers students a deep understanding and way of thinking about new technologies in an identifiable context. Beyond the D&T classroom, design fiction has the potential to contribute to students' growth as a citizen in a democratic society. The value of good D&T education is more than what the child does in the classroom, it challenges how they think about the world beyond school. D&T's full value offers a long-term impact on the students' life and, in turn, a benefit to society (Hardy, 2017). Because design fiction makes them to debate about the potential unintended consequences of new technologies students will be better equipped to understand, question and challenge decisions made by governments, designers and engineers about artificial intelligence, autonomous vehicles and other new technologies. Thus, empowering students to become educated citizens in a democratic society.

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