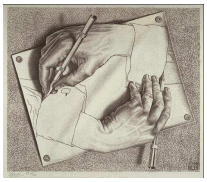
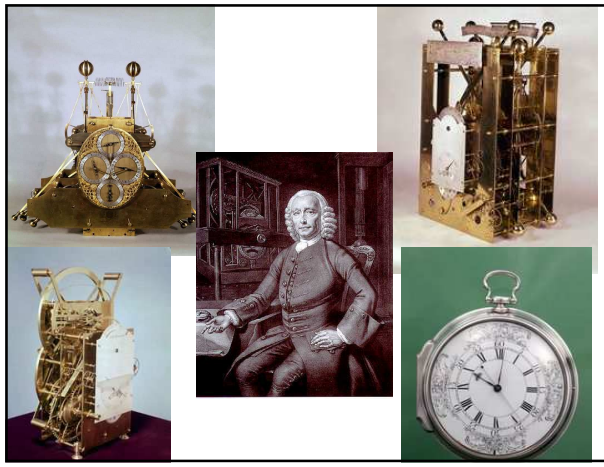
Reviewing some of the historical influences which construct ‘hands on’ learning



Dr Mike Brown
School of Education
LaTrobe University



Purpose

- Standing on the shoulders of giants
- Locating our teaching and learning within the much broader historical narratives associated with hands on learning
- VET (Vocational Education and Training)
- Applied learning
- Design and technology

1926

- Lewis Flint Anderson
- Charles A Bennett

but that’s not all . . . .

Gillespie (1993) and Blom (2005)

Three vignettes documenting the mysteries of the trade

- Moxon (1683) the mechanical exercises or the doctrine of handy work
- Diderot and the encyclopedia
- Della Vos and the Russian system

Work, technology and learning in

the early modern era: the renaissance

- Reclaiming the knowledge and practices of the ancients
- The rise of humanism
- Art, perspective, engineering, military machines, astronomy, the printing press
- Apprenticeship

Apprenticeship:

- A longitudinal strand in the history of work-related learning since antiquity
  ie. first evidence of apprenticeship is in ancient Egypt
- learning on the shopfloor, learning by doing, learning through observation, “stealing with their eyes”
  - suggests observation is a very conscious and active way of learning,
  - learning through the senses
- learning the ‘mysteries’ and ‘secrets’ of the trade

Work, technology and learning in

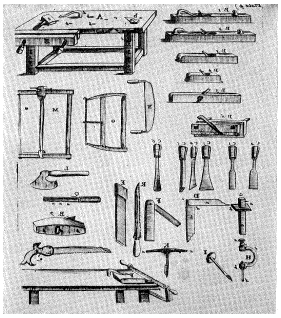
the early modern era: the reformation

- The church is confronted (Luther 1517)
- Humanism spreads
- 'To work is good' – the establishment of the work ethic
- Luther thinks that everyone should be educated – rich and poor, male and female

Historical figures and events that have impacted on 'hands on' learning (C16th and C17th)

- Francis Bacon and his philosophy of realism
  - Study nature and the natural world first hand
  - Use of the senses
- 1638 - Comenius – 'the father of modern pedagogy'
- Principles of mechanical arts, conception, materials and processes
- the method of the arts – a rational method for learning the arts
- apprenticeship
- Principal reformers in UK – Hartlib and Petty offer six principle reforms
- Royal Society of London
- Moxon's treatise on mechanical processes, tools, machines, projects and artefacts 1677 & 1683

Moxon's treatise: tools for joinery



Historical figures and events that have impacted on 'hands on' learning (C18th)

- Pestalozzi – 'the father of manual training'
- 1751 – 1772 the encyclopedia – an enlightenment project in France
- Neuhof industrial school experiment (as James Cook sails back from having landed in Australia) – the industrial school will assist poor children to get some education the idea is that the output of the work activity carried out through the school will pay for the cost of the education
- C18th sees practical experiments tried based on the ideas of Pestalozzi
- C19th sees some of these become an integral part of public education
- Manual work not yet recognised for its fundamental educational value
- Weigel - children learn with boards and blocks
- Franke Institute at Halle
- Rousseau
- Schools of Industry in Germany 1784 in UK at Hampshire in 1791

Pestalozzi looking after the pauper children

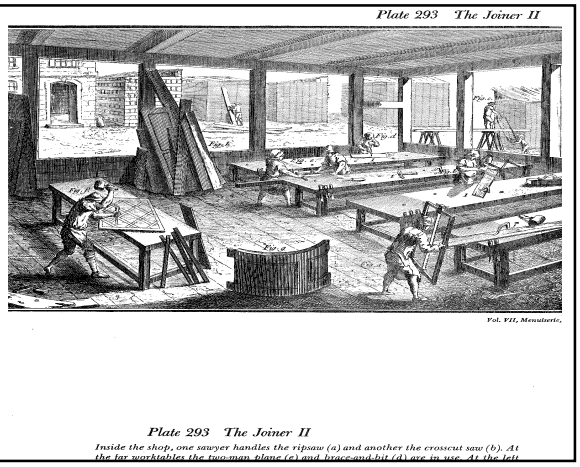
Fig. 16. Pestalozzi at Stanz. From *How Gertrude Teaches Her Children*, by Pestalozzi
Copyright, C. W. Bardeen, 1898

Historical figures and events that have impacted on 'hands on' learning (C18th)

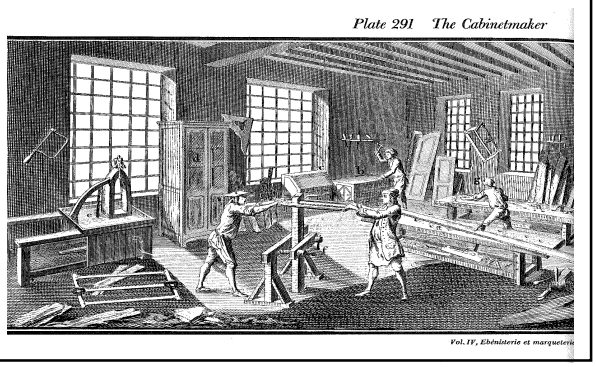
- Fellenberg – and some practical organisational ideas
- Fellenberg's Institute at Hofwyl 1771 – 1844 a practical school experiment
- Don't confuse the classes each should be educated for his own sphere
- Fellenberg's farm and trade school 1807
- School for girls train females for domestic occupation in the same station in life
- Fellenberg's Academy and the School of Applied Science
- Normal school
- Teacher education

Historical figures and events that have impacted on 'hands on' learning (C18th)

- Fellenberg's followers
- Heusinger who was a forerunner to Froebel, and a professor of philosophy and pedagogy at University of Jena ' how to utilise the child's desire for activity
- Niemeyer 1799 principles of education, including a statement on the use of manual arts
- Herbart and his views on manual arts
- Froebel and his doctrine of self activity, the direct heir of Pestalozzi's ideas
- Froebel – the kindergarten and his notions around the use of 'gifts' and 'occupations'
- Wehrli after running schools for Fellenberg branched out and ran his own farm school
- In France, Oberlin took up the ideas of Pestalozzi and Fellenberg
- Robert Owen puts forward some ideas



Cabinetmaking according to Diderot



Work, technology and learning in

the modern era: the enlightenment

- Technology, engineering and science take leaps forward (Newton to Darwin)
- The power of the church fades slightly
- Claimed to be an age of reason, knowledge expansion, invention, discovery and human progress ??
- Work houses, manufacturing and factories
- Marx and his critique of work

Historical figures and events that have impacted on 'hands on' learning (C19th)

- Industrial schools – for orphans
- Bache visited schools across Europe
- In Potsdam in 1837 he saw a school – really a set of 3 and elementary, trade and music schools
- The trade school taught blacksmithing, saddlery, tailoring, shoemaking and lithography and had 104 students
- At Frankfurt – for the trades,
- In UK a school for orphans that spent two hours a day in instruction in handicrafts in order to dispose them to useful trades
- Industrial reform schools
- Juvenile offenders
- Ragged schools of England and Scotland
- In 1855 in London alone there were 50 Ragged schools with industrial classes
- The Mechanics Institutes movement 1824

The Russian system of instruction in the mechanical arts

- In 1868 Victor Della Vos and his associates devised the Russian system of workshop instruction for use in the Imperial Technical school in Moscow.
- A thorough and systematic analysis was conducted of the tool processes and construction methods in the mechanical arts
- 'When the idea of analyzing the manual arts into their elements and of arranging these elements in pedagogical order was shown to be possible and practicable, it was recognised that these arts could be taught in schools by essentially the same teaching methods as the other school subjects'.
- A system of drawing worked out by Pestalozzi in 1824 but never used
- A system of sewing was worked out and used in teaching girls in England as early as 1847

The Russian system of instruction

- The length of the course was 6 years to train civil and mechanical engineers, draftsman, foreman and chemists
- Large workshops provided – took in outside 'live' work
- Instruction shops were established which were separate from construction shops
- Learning through making
- A progressive series of developmental exercises

The Russian system of instruction

The aims were to teach the fundamentals of mechanic arts . . . . .

- In the least possible time
- To give instruction to the largest number of students at one time
- A method that was sound and systematic in the acquirement of knowledge
- So the teacher could assess where each student was up to at any time

The Russian system of instruction

- Each type of work had its own shop eg joinery, blacksmithing
- Each shop has enough places and full sets of tools for each and every student
- Course of models in order of increasing difficulty and in strict order
- Models are made from drawing
- Drawing are made by students in their drawing class
- No pupil can start the next model until they have successfully completed the previous
- First exercises tolerances are allowed but later exercises must be exact
- Every teacher must be an expert in their own right

The Russian system of instruction

- First period teacher demonstrates and models, second period the teacher observes all the actions of the students, third period teacher uses peripheral observation but allows the student to develop independence
  (a forerunner to cognitive apprenticeship ???)
- Exhibited at the various world fairs - thereby exporting the system broadly across Europe and USA
- Runkle opened the first school based on the Moscow Imperial Technical School in Komotau Bohemia in 1874

The Russian system of instruction

- Provided an institutional substitute for apprenticeship training
- Proved that mechanical arts could be analyzed and their fundamental elements arranged in pedagogical order and taught as readily as other subjects
- When all proper equipment is supplied one teacher can teach a relatively large group of learners
- Individual assistance and follow up must be provided by the teacher
- Teacher must be an expert at their trade themselves, their work examples become an inspiration to the students
- first to use scientific principles in analyzing the trade and basing courses of instruction on these analyzes.

Who is documenting the trade and for what purpose ?

- Moxon: a social reformer, sharing the knowledge, making it public, making it widely accessible to others – learning the trade more efficient learning
- Diderot: part of a subversive challenge to the status quo, democratising knowledge, more broadly accessible, - learning more efficiently
- Della Vos: more efficient learning of the trades

Documenting the mysteries of the trade

- Middle class social reformers
- The use of literacy as a tool attempting to capture the knowledge of the working class
- Using literacy to bridge the divide between those who do and those who design and plan (the coordinators)
- Exposing the knowledge: taking what is hidden and making it explicit and more broadly accessible
- More efficient learning of the trade
- Facilitating a shift in the ownership of the knowledge: from those who produce knowledge to those who wish to coordinate its utilisation

Sculpture exhibition at Werribee