FEEDBACK TUTORIAL LETTER

2ND SEMESTER 2019

Management of Technology
MTC821S
Test
Dear MTC821S students

It was a pleasure meeting all of you. You showed hunger for learning which I applaud you all for. I am thankful for your participation during our vacation class. I wish you the very best in your future endeavours. Herewith find the feedback for the semester test.

Scholarly yours,

Dr Asa

Section A: Multiple Choice Questions

1. C
2. E
3. A
4. B
5. D
6. D
7. A
8. A
9. A
10. B

Total marks – 20 marks
Section B: Essay type questions

Question 1

Total – (10marks)

Technological innovation increases knowledge and makes more options available. On the whole, evidence suggests that technological innovation has increased GDP and standards of living worldwide. Technological innovation also, however, poses some risk of negative externalities, e.g.
- pollution;
- agricultural and fishing technologies can result in the erosion, elimination of natural habitats, and the depletion of ocean stocks;
- medical technologies can result in unanticipated consequences such as antibiotic-resistant strains of bacteria and viruses, or moral dilemmas regarding the use of genetic modification such as externalities.

Students may also suggest that technological innovation may (or has) lead to the loss of diversity in culture and traditions. The instructor may wish to encourage them to debate such risks of innovation versus the ways that innovation has enhanced our lives.

Question 2

Total – (10marks)

An individual's creative ability is a function of their intellectual abilities, knowledge, style of thinking, personality, motivation, and environment. In addition, an individual with only a moderate degree of knowledge of a field might be able to produce more creative solutions than an individual with extensive knowledge of field. The most creative individuals prefer to think in novel ways of their own choosing and can discriminate between important problem and unimportant ones. The personality traits deemed most important for creativity include self-efficacy, tolerance for ambiguity, and a willingness to overcome obstacles and take reasonable risks. Intrinsic motivation has also been shown to be very important for creativity.

Innovation is, however, more than the generation of ideas. It is the implementation of those ideas into some new device or process. Evidence suggests that not all inventors are innovators. In fact, many ideas have been left on the drawing board, so to speak, or in the inventors’ garage.
entrepreneurial skills necessary to convert an idea into a new product or process are very different from the skills and thinking orientation that generated the original idea. An inventor usually will have a tendency toward introversion that may make it difficult for them to convey their ideas to others. As we saw in the Segway case the company addresses the need to incorporate both sets of skills to achieve innovation by forming teams with a mix of “ideation” and “execution” people in acknowledgement of finding all these skills in one individual.

**Question 3**

**Total – (10marks)**

Early on the decision not to invest in a new technology can be financially justified (on the surface) by the lower returns to effort earned by investing in a new technology and the large investments already made in the incumbent technology. The reasons that play the largest role in deterring a firm from investing in a new technology have less to do with the financial factors and more to do with the nature of a firm’s capabilities and the type of knowledge underlying the new technology. Firms will not adopt or delay adoption of a new technology because:

1. Their focus on improving the processes supporting the current technology has decreased their ability to identify and respond to a technological discontinuity. In other words, the firm may not know what hit them. Not that the focus on improving current processes has to result in a lack of focus on new architectures. It is however a general tendency for firms to decrease or cease to invest in the search for new architectures when they have a currently successful technology.

2. The complexity of the knowledge underlying new technologies is also part of the answer, particularly if the knowledge needed is tacit in nature. Acquiring tacit knowledge often requires learning from another person directly which can be both time consuming and costly.

3. In addition, the degree to which firms must develop new complementary resources also plays a role. If firms must make large investments in time, money, or both, in the complementary resources needed to utilize a new technology successfully adoption can be delayed.

4. It may also be the case that firms, like individuals, also have traits that lead them to be innovators, early adopters, laggards, etc.
Question 4

Innovation enables firms to:
- introduce more product and service variations, enabling better market segmentation and penetration;
- improve existing products and services so that they provide better utility to customers;
- improve production processes so that products and services can be delivered faster and at better prices.

Increasing globalization has both expanded the potential markets for many firms while simultaneously exposing them to greater competition; this has resulted in firms putting more emphasis on innovation as a lever of competitive differentiation. Furthermore, information technology has enabled such process innovations as CAD/CAM, rapid prototyping, and flexible manufacturing, enabling firms to produce more product variants faster and cheaper. This is a double edged sword: it has enabled product lifecycles to shorten (making rapid innovation more imperative) while simultaneously improving a firm’s options for innovation.

Question 5

Students will bring a wide variety of experience to answering this question. They should address all four of the following dimensions in their answer: product versus process innovation, radical versus incremental, competence enhancing versus competence destroying, and architectural versus component innovation.

Question 6

The dynamics underlying the s-curve shape of technology performance improvement and rate of diffusion are related but also different. For example, improvements in a technology’s performance are likely to translate into faster adoption rates. In both processes, performance improvement and diffusion, the
initial phase is characterized by a poor understanding of the technology. In the case of technology improvement firms are just beginning to understand the technology and the processes needed to support it. In the case of diffusion, adopters vary in their degree of risk aversion and excitement over new products (e.g. laggards will wait until all the “bugs” have been worked out and the price has decreased to buy a new product). The second phase is characterized by a deeper understanding of the technology, both on the part of firms and consumers, resulting in rapid process improvements and adoption. Finally, the technology reaches its inherent technological limits which flattens out the performance improvement curve and, on the diffusion, front most consumers have either adopted the new product or never will.

**Question 7**

(10marks)

Firms can increase the likelihood that their technology will become the dominant design by:

a. increasing the technologies’ standalone value to the customer (e.g. superior functionality at a competitive cost),

b. increasing the technologies’ network externalities value by encouraging developers of complementary assets to create products for their technologies,

c. advertising heavily to create a perception that the installed base is larger than it is or that a new product with superior capabilities will be launched soon (so that consumers do not buy a product already available),

d. Leveraging an incumbent technology’s complementary assets and installed base by making their technology compatible with the incumbent technology.

**Question 8**
Early entry can afford the first mover the opportunity to establish brand loyalty and technological leadership, both of which can increase its installed base. And if the market is characterized by increasing returns to adoption the first mover can garner two additional benefits from 1) moving up the learning curve before their competitors and 2) building an installed base that keeps increasing due to the self-reinforcing nature of network externality processes. Entering a market late, however, can be cheaper, easier, and more certain. The late mover can avoid much of the development expense and risk borne by the early movers, and can fine-tune the product to fit customer needs (which are now more certain) better.