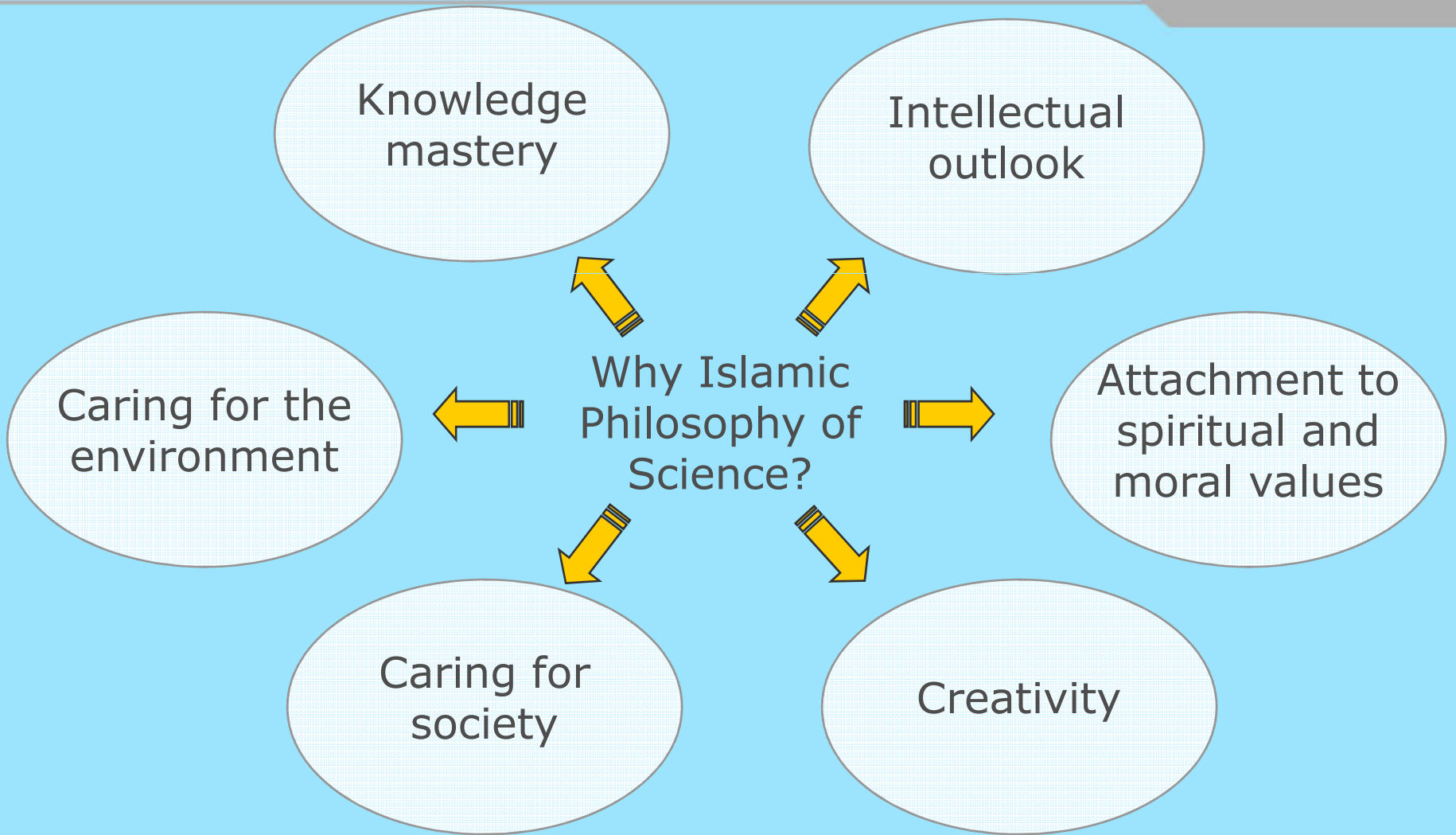
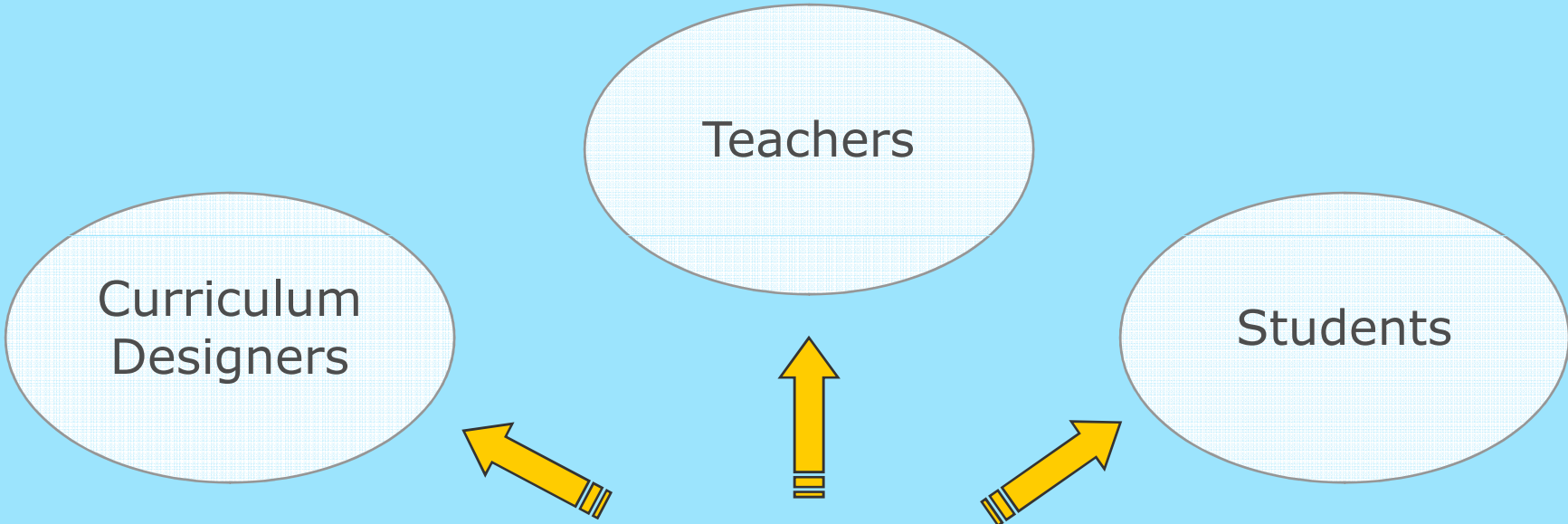


**ISLAMIC PHILOSOPHY OF SCIENCE
IN
ENGINEERING EDUCATION**

by
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For Whom
Islamic
Philosophy
of Science?

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graph TD; A[Philosophy of Applied and Engineering Sciences] --> B[Epistemological Issues]; A --> C[Ethical Issues]
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Philosophy of Applied and Engineering Sciences

Epistemological Issues

Ethical Issues

Epistemological Issues

- Epistemological status of applied and engineering sciences.
- Tawhidic principles of applied and engineering sciences.
- Scientific methodology and creative thinking.
- Aspects of Islamic art and design, which are particularly relevant to engineering sciences.
- Critique of contemporary applied and engineering sciences in the light of Islamic philosophy of science.

Ethical Issues

- Ethical Issues of applied and engineering sciences.
- Principles of the *Shari'ah* governing the process of scientific and technological development.
- Contemporary ethical issues in applied and engineering sciences.

Epistemological Issues

- 1 Epistemological status of applied and engineering sciences.
 - Definition of its domain of study.
 - Conception of applied and engineering sciences in Islamic and modern western epistemologies (a comparative treatment).
 - Place of applied and engineering sciences in Islamic classification of knowledge.
 - Brief historical background of their development in Islamic civilization.

Epistemological Issues

- ② Tawhidic principles of applied and engineering sciences.
 - The mathematical, biological, and physico-chemical structure of the cosmos according to the Quran and *hadiths*, Muslim philosophers and scientists, and modern science.
 - Identifying scientific, engineering, and technological principles from the above structure.
 - The Quranic concept of “signs of God” (*ayatullah*) as a textual basis of the *tawhidic* principle of the cosmos as a reflection or manifestation of Divine Names and Qualities.

Epistemological Issues

- Study of selected Divine Names and Qualities which have the greatest relevance and significance for the understanding of fundamental concepts and ideas in applied and engineering sciences, and their unique characteristics; these include such Names and Qualities of God as the Compassionate and the Merciful, the All-Knowing, the All-Wise and the All-Powerful Creator, the Originator, the Beautiful, the Mathematician, the Designer, the Artist, and the Perfectionist.

Epistemological Issues

- Applied and engineering sciences as a human imitation of divine knowledge, wisdom, power, and creativity as manifested in the cosmos and more specifically in nature.

Epistemological Issues

- ③ Scientific methodology and creative thinking.
 - The structure of human cognitive consciousness; discussion covers the four key Quranic terms, namely *'aql* (intellect-reason), *qalb* (heart), *ruh* (spirit), and *nafs* (soul).
 - The division of *'aql* into its different parts with their respective roles and functions in the thinking process.

Epistemological Issues

- The role of the five (external) senses and the imaginative faculty (internal senses) in relation to the thinking process.
- Logic as a tool of scientific thinking; understanding fundamental elements of logic and the principles of logical thinking.

Epistemological Issues

- Elements and principles of scientific methodology, covering such questions as classification of data and the different ways and methods of deriving new information and knowledge from them, including mathematical methods, leading to various levels of theory construction.
- Islamic and modern western concepts of scientific and technological creativity; intellectual, spiritual, mental, and even socio-cultural conditions of scientific creativity.

Epistemological Issues

- ④ Aspects of Islamic art and design, which are particularly relevant to engineering sciences.

Epistemological Issues

- ⑤ Critique of contemporary applied and engineering sciences in the light of Islamic philosophy of science.
 - Identification of “controversial problematic” concepts, ideas, and theories in such fields as artificial intelligence, information theory, genetic engineering, and environmental sciences.
 - Discussion of epistemological implications of these “controversial or problematic” concepts, ideas, and theories.

Ethical Issues

- ① Ethical Issues of applied and engineering sciences.
 - Ethical principles in the Quran and *Hadith* governing the production, acquisition, teaching and dissemination of knowledge.
 - Ethical basis of classification of knowledge into the *fard 'ayn* and the *fard kifayah* types, the praiseworthy and the blameworthy, or into the useful and the useless kinds.

Ethical Issues

- ② Principles of the *Shari'ah* governing the process of scientific and technological development.
 - The five categories of human acts, namely the obligatory (*wajib*), the forbidden (*haram*), the recommended (*mandub*), the reprehensible (*makruh*), and the permissible (*mubah*).

Ethical Issues

- Man's position as God's *khalifah* (vicegerent) on earth and its implication for the ethical and moral and social responsibility of scientists and technologists over their discoveries and inventions, as well as its implications for their guardian-ship over nature and their management of its resources..

Ethical Issues

- Geographical-climatic and socio-cultural context of scientific and technological development:
 - (a) The importance of intimate knowledge of local geographical-climatic conditions so that these (including the “hostile and disadvantageous”) may be transformed into assets in the way the Israelis transform barren deserts into fertile, agricultural lands;
 - (b) Geographical-climatic conditions as an important factor in scientific research and development planning;

Ethical Issues

- (c) Science and technology, not as instrument of economic exploitation and political domination of one group over another, but as instrument of social justice and economic welfare of all mankind;

- (d) Socio-cultural values derived from the *Shari'ah* in shaping scientific and technological development.

Ethical Issues

- ③ Contemporary ethical issues in applied and engineering sciences.
 - Identification of major ethical issues in such branches of contemporary applied and engineering sciences as agricultural sciences, biotechnology, genetic engineering, and chemical engineering.
 - Resolution of the above ethical issues in the light of Islamic ethical philosophy.