ISLAMIC REFLECTION IN TEACHING AND LEARNING PHYSICS
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ABSTRACT
Teaching and learning physics without spirituality is lifeless and can drive materialistic motivations. In giving it life Muslims must teach physics from the Islamic worldview. The attributes of the Creator must be emphasised in the learning environment and students be made aware of the fact that the physical world around them is the second form of revelation. Reading these signs and connecting to the revelation of Quran creates the necessary awareness of Allah SWT. This paper discusses tools in Islamic reflection derived from ideas and theories in Islamic psychology that can be adopted in physics education.

Keywords: Physics, teaching and learning; islamic education; islamic reflection; islamic psychology
1.0 INTRODUCTION

Verily in the creation of the heavens and the earth, and in the alternation of night and day, there are indeed signs for men of understanding. Those who remember Allah standing, sitting and lying down on their sides and thinking deeply about the creation of the heavens and earth, (saying), ‘Our lord! You have not created (all) this without purpose, Glory to You!. Give us salvation from the torment of the fire. [Ali-Imran 3:191]

Islamic reflection in this paper refers to the meaning of tafakkur in Arabic and is a form of worship that is highly rewarded by Allah swt. In the verse above, Allah swt calls us to reflect or think deeply upon His creations so we can know Him, glorify Him and love Him. It is an act which is necessary and central to our faith. In reflecting the creations of Allah three of our senses, eyes, ears and spiritual heart are used. Our senses of perception are the windows to the knowledge of Allah swt.

Signs pointing to the Majesty of Allah are of two kinds. The ayat of Quran and the ayat of creation (the world around us). Everything around us is a sign. The sun and moon, plants and animals, mountains and rivers, wind and rain, the process of breathing, the cycle of life and death are some examples. Thus a sign can be tangible or intangible matter like a process or an event pointing us to the Creator Himself as stated in the verse of the Quran below.

Behold! In the creation of the heavens and the earth; in the alternation of the Night and the Day; in the sailing of the ships through the Ocean for the profit of mankind; in the rain which Allah sends down from the skies, and the life which He gives therewith to an earth that is dead; in the beasts of all kinds that He scatters through the earth; in the change of the winds, and the clouds which they trail like their slaves between the sky and the earth; (here) indeed are signs (AYAT) for a people that are wise….[Al-Baqara - 2:164-165]

Both kinds of signs are reminders of Allah. The ayat in the Quran reminds us of the ayat in the world around us and the ayat around us are supposed to remind us of the ayat in the Quran. The Quran feeds the Ruh, directing us to look at the world around us in a different light where everything becomes a reminder to the miraculous signs of our Creator. We start seeing with our hearts and continuously thinking about Allah. Continuous remembrance of Allah swt increases our iman insyaallah.

However, this process is not easy. We have to train ourselves to reflect upon the ayat of creation and connect it to the ayat of revelation. The more knowledge we have in these two kinds of ayat, the easier it is to reflect and connect them. An easy example would be if a believer sees dried wilting plants come alive after the rain, he is reminded of the resurrection. How Allah brings out new life to plants from the earth is similar to how we will be raised on the day of resurrection. A non-believer would see the plant and is completely heedless of the reminder given by the plant. A scientist believer who understands the process taking place in the growth of the plant marvels at the miraculous nature of the plant. It makes its own food, bear fruits and provide food to other creations. He further reflects that Allah swt could have created just a few species of plant for the same purpose but instead He blesses us with various species of plants in varieties of colours, shapes and sizes for our enjoyment. Subhanallah.

Allah says in the Quran:

It is He who sends down water (rain) from the sky, and with it We produce vegetation of all kinds, from some We produce green (crops), out of which We produce grain, heaped up (at harvest); out of the date-palm and its sheaths (or spathes) (come) clusters of dates hanging low and near: and (then there are) gardens of grapes, and olives, and pomegranates each similar (in kind) yet different (in variety): when they begin to bear fruit, feast your eyes with
the fruit and the ripeness thereof. Behold! in these things there are signs for people who believe. [Al-Anaam - 6:99]

Physics is a study of matter, energy and their interaction. Knowledge of physics or any other discipline detailing the signs of Allah doesn’t necessarily take one beyond the superficial aspect of reality, or transport one from the wonders of creation to the Creator. Only a believer scientist crosses this boundary of wonder of creations to the awe of the Creator. What moves the heart of a believer is that he knows Allah the Creator is Al-Khaliq. A believer knows the secrets he learns the details of natural laws which is the Divine laws that govern Allah’s creations.

Allah says of heedless people:

We have created many jinn and people who are destined for Hell, with hearts they do not use for comprehension, eyes they do not use for sight, ears they do not use for hearing. They are like cattle, no, even further astray: these are the ones who are entirely heedless. [Al-A'raf-7:179]

May Allah make us use our intellect to gain knowledge and to reflect on His creations and not make us among those who are heedless.

The next sections discuss reflection from the perspective of Islamic psychology advanced by Malik Badri in his book “Contemplation – An Islamic Psychospiritual Study” (2000) and the impact of cognitive thinking on the heart and mind of a person is highlighted. Ideas, techniques and theories is discussed and tools for reflection in physics is presented.

2.0 MATERIALS AND METHODOLOGY

2.1 The impact of cognitive thinking on the heart and mind of a person

Badri (2000) mentions that the study of Islamic reflection from the psychological point of view necessarily deals with the conscious inner cognitive thought and feelings of people. And he says that according to Joseph Pearce (1992) when we are in deep spiritual contemplation, we are drawing from our spiritual universal heart, which in turn influences our physical heart that communicates with our brain and influences our cognitive activities. This is in some respects similar to the view of Imam Ghazali in his Ihya Ulum al-Din in which he clearly states that although the spiritual heart (qalb) which is the controlling centre of the soul is different from the physical human heart, its functioning is related and directed by it.

Further Badri relates that cognitive psychologists claim that complex responses that influence people’s ideas, beliefs, voluntary decisions and observable complex behaviours come from previous conceptualizations, emotions and experiences which give meaning to subsequent environmental stimuli. In other words, it is what people think affects their beliefs, feelings and consequent behaviour. If their thinking is centred on the creation and bounties of Allah swt, their faith will increase and their deeds and behaviour will improve. Similarly if, their thinking is centred on their pleasures and desires, they will be distracted from their religion and their behaviour will degenerate. If their thinking is about their fears, frustrations, failures and consequent pessimism, they will be afflicted by reactive depression and other psychological disorders.

Badri mentions that the cognitive psychologists have shown that every intentional activity performed by the individual is preceded by an internal cognitive activity. They have also
proved that the human mind never stops its cognitive activity at any moment of the day or night, whether the individual is aware of it or not. Therefore it is the internal cognitive activity of a human being whether conscious or unconscious, that directs observable human behaviour. This cognitive perspective of human behaviour is in line with Islam in that reflection as an internal thought process is the backbone of faith in which it is the source of every good deed. Furthermore, when the cognitive activity gains strength, it can become an incentive for action. If the individual performs this motivated action repeatedly, then this internal ideas can easily and spontaneously make it become a rooted habit.

Badri further elaborates that Imam Ghazali insists in his book Al-Hikmah fi Makhluqat Allah that contemplation is key to every good deeds because it qualifies all cognitive actions of the believer with the remembrance of Allah and the recognition of His favours and grace. Clearly reflection covers the intellectual, emotional, temperamental and perceptive aspects of the believer which are all the psychological, cognitive and spiritual actions. Thus a believer who remembers Allah will reflect His creations and one who reflects His creations should remember Allah. Thus the cognitive process involved in Islamic reflection makes a reflective person is in constant remembrance of Allah SWT and so can purify a believer’s soul and elevate his level of faith.

With faith as the driving force of reflection, a believer reflects upon the signs written clearly in the perfection of planning, function and form of all Allah’s creations. He devotes his internal cognitive and spiritual aspirations to the reflection of Allah’s Majesty and Perfection, achieving the objective of reflection in Islam in which is to gain a deep insightful knowledge of Allah as the Creator, Sustainer and Provider of the universe. In addition, he certainly develops the sentiment of awe and love of Allah and the refined feelings of contentment, happiness and tranquil of the fact that there is Ar-Rahman, the Ever Merciful taking care of him.

2.2 Tools in Islamic reflection

Four stages of reflection are outlined in Badri’s book. The first three stages are interconnected leading to the final fourth stage. Stage one is when knowledge of the reflective object is through direct senses which are seeing, hearing, touching, smelling and tasting, or indirect sense as in imagining. Such information is purely mental and often non-emotional.

The second stage is when one takes a closer look at the object, inspecting its aesthetic aspects and particular qualities. It is a shift from mere perception to a state of wonder at the beauty, excellence, vastness of structure, and miraculous appearance of the object. It is a stage of fine appreciation, delicate feeling and powerful passion.

The third stage is achieved when one crosses the boundary between the created object of wonder to the creator of the object of wonder. One is then carried away by the feelings of submission to the Creator of the object and the feeling of appreciation of the Creator Who has gifted one with the object and everything else in the universe. One comes to the realization that there is nothing in existence save Allah and what He has originated.

When this refined reflection is repeated and reinforced with continual remembrance of the Almighty Allah, it leads a believer to the fourth stage. This stage is the spiritual cognition
where spiritual feelings associated with deep reflection become part of the believer’s nature making him more loving and fearful towards Allah swt.

The first and second stages can be enjoyed by believers and non-believers alike. The beauty in form and structure can be appreciated by both. However the third stage can only be reached by a believer who relates the beauty of the universe to its Creator. A believer who reaches the fourth stage sees precision, beauty, mercy and wisdom in all creations in the world. He becomes more appreciative and humble and sees that everything in existence is in the hands of Allah swt. This vast universe is nothing but a place of worship to which only believers can access. These feelings of bewilderment are inherent in man so they can look at the heavens and the earth for guidance toward their Rabb and can worship Him in total submission.

The depth of reflection varies according to the individual. Badri in his book discusses nine factors that influence the depth of reflection. The first and foremost factor depends on a person’s level of faith. His closeness to Allah swt determines his ease of reflection. Thus it is easier for him to invoke the feelings of appreciation and love of the Creator. The next factor is the personality and his ability to concentrate over a length of time. Research has shown that introverts are better able to concentrate longer compared to extrovert. The third factor is one’s emotional and mental state. Indeed reflection requires peace of mind and sound intellect. The environmental factor is the fourth factor. A more conducive environment for reflection would make a person reflect better. Badri gives the example of a muslim man who works in the country with all comforts provided to him and has a wife who teaches Quran classes would be in a better position to reflect compared to a person working long hours in the city having a hectic life to fulfil daily requirements. The fifth factor is the influence of culture or upbringing. If throughout his life he is exposed to appreciate nature, he would reflect better that a person who has been exposed to appreciate material and superficial things. An expert in the field of the object of reflection knows the details of the subject. He can appreciate and think deeper than a layman reflecting on the same object. Thus the factor of knowledge of the object of reflection is the sixth. The influence of good example and companionship cannot be overemphasized. This makes the seventh factor affecting the depth of reflection. The eighth and final factors are the nature and familiarity of the object of reflection. It is easier to reflect upon what is obvious such as the beauty and grandeur of night sky than to reflect upon the process of digestion. However sometimes over familiarity of the object of reflection hinders ones reflection. A person may rarely look up at the night sky and reflect but he can get so overwhelmed by the ocean when he goes on holiday. Therefore the greater the familiarity with our surrounding, the heavier the veil over our vision and awareness is. We fail to observe and remember important things.

The tools of reflection discussed above can be applied in teaching and learning physics. Both students and teacher benefit from reflection. Knowledge of the subject matter increases in tandem with the knowledge of Allah swt. The practice of deep reflection is continuously improved with every lesson until it becomes habitual. Eventually spiritual reflection is inculcated both in students and teacher insyaAllah.
### 3.0 RESULTS AND DISCUSSION

#### 3.1 Execution of islamic reflection within a physics lesson

Figure 1 shows a framework, ‘Connecting to Islam’ discussed by Roselainy Abdul Rahman et al. (2014) which identifies which Islamic components should be integrated into lessons so as to support instruction and students’ learning. Here it is clearly seen that islamic reflection in teaching and learning of physics is a component under *tadabbur alam* wonders of the creation.

![Diagram of Connecting to Islam framework](image)

In preparation of a lesson, the teacher may consider the following steps. Choose a topic in Physics to be taught. Prepare the lesson plan with reflection. Reflect upon the object of study in both the physical and spiritual sense. Think deeply and make the connection between both aspects of reflection. Outside the classroom, both students and teacher continue reflecting by actually looking at the object of reflection resulting in continuous remembrance of Allah. An example of a lesson on light for first year undergraduate is given.

What is light? Light is a type of transverse, electromagnetic wave that can be seen by humans. It behaves both like a particle and like a wave. This is commonly termed as wave particle duality of light. Like all electromagnetic waves, light can travel through a vacuum with the speed of light! The transverse nature of light can be demonstrated through polarization. Within this short introduction to light, reflection can be initiated. Light from the sun which is millions of kilometres away is able to reach us in eight minutes without being slowed down by any matter. It enables us to see, plants to make food, oceans to warm up creating the ocean circulation so marine animals can live and thrive.
How is light behaving like a particle or a wave? It exhibits the phenomena of reflection, refraction, diffraction, scattering and polarization. The concept is elaborated and we can go on reflecting on its particle-wave behaviour and the wisdom behind these behaviour. The lesson continues with further reflection until the end. Verses of Quran and sayings of the prophet are included in the reflection where appropriate.

With practise in coming lessons and with perseverance, deeper and more meaningful reflections are achievable and the process will become easier insyaAllah.

4.0 CONCLUSION

In conclusion, islamic reflection in physics should be reintroduced in education and in research as were the tradition of previous scholars. They were spiritually motivated and driven and they achieved great heights and created the islamic civilisation that we repeatedly and proudly recount but sadly lost. “He who remembers his lord and he who doesn’t remember his lord are like the living and the dead” Hadith narrated by Bukhari in Riyadhussaliheen’s The book of Remembrance.

REFERENCES