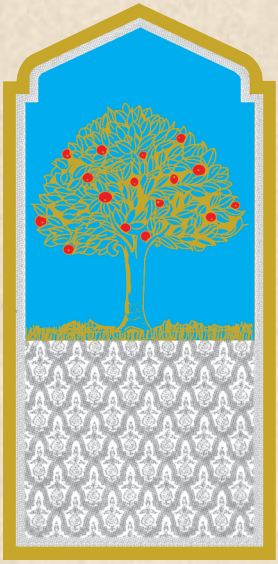

AL-SHAJARAH

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AL-SHAJARAH

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MASTERY-HUMILITY MODEL: FROM CONVERGENCE TO INTEGRATION

Ruslan B. Hassan[1]

Abstract

The perpetuation of dualism has permeated the field of engineering education, resulting in professional outputs not synchronised with personal life. The absence of a spiritual value system persists in the curriculum, which relies on pragmatism, positivism, constructivism, and relativism. This highlights the pressing need for the integration of spiritual values. This two-step process develops a convergent mastery-humility model using a sequential exploratory design approach. The construct validity, a key aspect of this research, achieved CFI .963≥. 95, TLI .956> .90 and RMSEA .068 < .08, validating the model's reliability. Upon verifying the measurement model, SEM then confirmed the theoretical proposition that mastery and humility form the converging variable. The converging platform is at the state of Al-Adl, the correct position of knowledge is mastery where all things should be, and for man, the proper position is in the 'sujud' position, as 'Abd'. The Islamisation of Knowledge (IOK) takes place when any theoretical development, derivations of formulation, and application is based on the governing concept of Bil-Mizan (balance, equilibrium, justice) towards the state of Al-Adl and then Al-Khaliq. The next step involves this cognisance of meaning. The latter concerns the meaning of our existence with the humility of an Abd who must respect the truth. Hence, cognisance is required to seek the truth and differentiate between the Creator and the created. Thus, integration occurs at the same phase, though, in cognitive and affective domains. In conclusion, for this two-part process, the IOK is given a more defined form preceding the integration in the thought process, invigorating the spiritual dimension in the engineering curriculum.

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Keywords: Convergence, Affective, Cognitive, Justice, Meaning

Introduction

Generally, in Engineering, one is a novice when he is new to his job or knows little. As an engineer in training, supervising engineers assess his ability to apply what he has learned as a student and upon becoming a Professional Engineer. He becomes competent when performing to basic standards based on the Code of Practice and becomes 'experienced' when he can vary his performance based on unique situations. Mastery is comprehending and practising the full extent of one's craftsmanship. One achieves mastery when he can invent new and better ways to do a job. In other words, he can optimise his design by being efficient.

Humility is not the same as low self-worth or no confidence. Nor is humility wallowing in self-pity. Humility is a sign of strength of character, uprightness and exceedingly empowering. It is respecting the truth and realising the difference between the created and the Creator, resulting in one's *Ubudiah* position. Humility is a sign of strength and virtue and incredibly empowering. It is a reflection of spiritual, mental, and emotional maturity. Some of the righteous predecessors (*salaf as-salih*), like Ibn Rajab (1335- 1393), said:[2]

> "Accepting the truth from whoever brings it is one with humility. Whoever accepts the truth from anyone, whether young or old, whether he loves them or not, is humble."

When a certain level of mastery is achieved, and the expertise attained by no means makes one arrogant and think highly of oneself only at others' expense. This '*takabbur*' (arrogant) behaviour may lead to more significant harm and deviate from the right path. Thus, the necessity of the '*Tawḥid*ic' principle in the engineering curriculum and the '*Mizan*' emanating from it. One must realise the

[2] Yaqeen Institute for Islamic Research (YIIR). Finding truth in the age of fake news information literary in Islam." Accessed September 15, 2024, https://yaqeeninstitute.org.my/read/paper

various forms of divine intervention in one's professional and personal life. Therefore, he needs to balance his egoistic trait with humility. He needs to be mindful of his role as His vicegerent, and his '*akhlaq*' (disposition) should demonstrate the practical implications of his faith. Moral or *Akhlaq* is an essential aspect of Islam, and this could be tacitly understood through the Prophet's mission, which is itself to perfect morality and mannerism.

Islamic Science

Scientific facts with no direct bearing on morality and religion are frequently used in engineering. If closely observed, the facts depend on specific theories and concepts and are realised only when built into a coherent whole. Thus, a fact is like a brick of a building. By putting all the bricks together then, a structure is formed. Therefore, the brick or fact is encapsulated within a framework or pattern scheme that can relate to the truth. This relates to the religious truth, which is concerned with the general conception of reality as a manifestation of Allah *(swt*). The facts with their conceptions developed within the Islamic scientific conceptual scheme cannot yield any disparity between science and religion.

Statement of Problem

Scholars differ on the steps to be applied in the Islamisation of Knowledge (IOK), suggesting different approaches and methodologies. Many Muslim scholars have accepted the rationale for the Islamisation of Science. However, there has yet to be an agreed-upon method for how the actual Islamisation of Science occurs today. Although the 'integration of knowledge' was the mainstay of the approach at the 1977 Mecca Conference, it remains unclear how it is to be done.

The 'Vienna Circle' (1925-1936) influenced many branches of formal and empirical sciences extending beyond philosophy, such as arithmetic, physics, geometry, biology and psychology, and the social sciences. They formulated what is known as 'the scientific conception of the world', which is characterised by two features: empiricism and positivism.

Empiricism is an epistemological view that holds that true

knowledge comes only from sensory experience. Positivism is a philosophical school that holds that all genuine knowledge is derived from reason and logic from sensory experience. Other ways of knowing, such as intuition, introspection, or religious faith, are considered meaningless. It is marked by applying a particular method, logical analysis, as practised in modern symbolic logic.

Modern science is steadfast in believing that all the happenings in the universe exist or are created by causes and natural laws: a self-contained universe. There is no place for God. On the other hand, some believe that since everything is already under Allah SWT's will—after all, He is 'al-Rabb'—there is no need to Islamise engineering anymore. These seemingly contrasting views have resulted in ignorance of the role of spirituality in engineering.

Engineering is defined as utilising the forces of nature for the good of humankind. The forces are expressed in mathematical forms and the sciences, particularly physics. Mathematics is the crystallisation of logic, whereas physics is logic applied to the real world. Thus, although engineering is the application of the principles of science termed technologies, it is still value-laden. Logic is to be guided by divine revelation.

Empirical and rational faculties alone cannot ascertain divine knowledge. This error has to be corrected. If the facts of science are developed within the Islamic domain and concepts, it cannot produce a disconnect between religion and science. There should be a link between the two. The unity of spiritual knowledge and scientific occurs when each of the particular sciences is 'organically' related to the supreme knowledge of *Al-Tawḥid*.[3] Henceforth, the IOK task is to converge spirituality and engineering via science. It requires an equivalent or almost equivalent to the convergence of authentic spirituality with the 'sacred science of the cosmos rooted in its sacred reality' *as Nasr*[4,5] *has suggested.*

[3] Bakar, Osman. Tawḥid and Science: Essays on the history and philosophy of Islamic Science, Arah Publications: Second Edition.2008.

[4] Nasr, S.H. Spirituality and Science: Convergent or Divergent, Chp.15, the Essential Sophea, 2006 www.worldwisdom/public/library/default.aspx

[5] Nasr, S. H. Cosmology (ed.) Science and Technology in Islam: Part 1, UNESCO Publishing, 2001.

Research Objectives

In the early days, specifically from the 7th. Century AD to early 19th. Century AD, concepts of initially foreign origin were always integrated into the unitarian perspective (*Tawḥid*) of the *Al-Qur'an*. They are thoroughly Islamic, which is the most profound meaning of the term, in that they depict a universe originated by the Almighty. They are integrated and interrelated in a hierarchic structure reflecting His oneness. Thus, this study aims to develop a new model based on the doctrine of *Tawhid* and *Bil-Mizan* emanating from it to be ingrained in the attributes of mastery and humility of the graduates.

The following objectives are the aims of the study: [6]

1. To establish mastery beyond competency as the outcome of the engineering curriculum to fulfil the role of *Khalifah'* (Vicegerent).
2. To establish '*Tawadhu*k' (Humility) as the characteristic of '*akhlak*' (ethics) in the Islamic ethical dimension of '*Ubudiyyah*' (Servitude)
3. To develop a convergent position between mastery with humility governed by '*Bil-Mizan*' ('balance'), which emanates from '*Tawḥid*' (Oneness of Allah, (*swt*)). The research questions then focus on mastery and humility.

Research Questions

The following are the research questions:

1. What is mastery in engineering, and does it differ from competency in the attributes of engineering graduates?
2. What is humility in the Islamic ethical dimension?
3. How can the governing theory be generated to enable the convergence of mastery and humility in the achieved learning outcomes?

The first component of the study, mastery, is established to be beyond competency such that with this attribute, the graduates can

[6] Hassan, R. Developing a convergent mastery-humility model for the Tawhidic-based Engineering Curriculum, Doctoral dissertation, IIUM, 2021.

assume the role of *Khalifah* (vicegerent). This involves the cognitive domains. The second component, humility (*Tawadhuk*), falls under the affective domain. The third component deals with constructing the alignment of the present pedagogy for the convergence of mastery and humility in the attributes of engineering graduates.

Significance of the Study

With this *'ilm*', it is fervently hoped that a 'real-world' engineer can be moulded, with mastery of the engineering field together with personal humility, modelled after Rasulullah (pbuh), a man-of-action par excellence whose entire life illustrates clearly the idea of an efficient application of the principle of *Tawḥid* to the society.

Theoretical Background and Model Development

Guidance for Engineering

It is a misconception that Allah SWT left us without guidance and left matters of science only to scientists. The noble *Qur'ān* relies on general 'pointers' to address issues related to specialised philosophical or subtle spiritual realities or engineering because the primary function of the Qur'ān is the comprehensive discussion of practical matters related to Guidance and the Straight Path. He says: "...We haven't neglected anything in the Book…". (Qur'ān, *Al-An'am*:38) and in the same Surah, another verse says, "… not even a single leaf that falls without His knowledge …." (*Qur'ān*: 21:59).

Those trained minds who are mindful of the spiritual dimension will be able to identify God-Self Disclosures (GSDs) and make connections necessary for the benefit of all. In this paper, the reference for balance and stability is the moon-earth-sun configuration in other words, Allah SWT guides us in any engineering pursuits by understanding this physical cosmology.

Theoric-Metaphysics

There is the theological-metaphysical significance of the celestial bodies' orbital motions, particularly the Sun, Earth and the Moon.

"Allah set up the heavens with no visible pillars; then He established Himself above the Throne and made subject the moon and sun, each running (its course) for a specified term. He arranges [each] matter; He details the signs that you may, of the meeting with your Lord, be certain" (*Qur'ān*, *ar-Ra'd*: 2)

Three points of significance are mentioned:

a) Allah SWT controls the orbital motion of moon-earth-sun and other celestial bodies. If there is more than one creator, chaos will prevail.

b) The solar system is designed with precision by none other than the planner-designer-creator (*Al-Khaliq*), the Wise (*Al-Hakim*) and the All-Powerful (*Al-Qadir*).

c) The orbit starts at a point and returns to the same point repeatedly. This confirms that our return to Him is steadfast and sure.

Celestial mechanics applies principles of physics (classical mechanics) to objects' motion in outer space. The stability of the motion is established by the condition of the gravitational and centrifugal forces (*Bil-Mizan*). Divine laws govern them. Most modern science and its philosophy see the order and regularity of nature's phenomena as evidence that the cosmos does not need God to function (clockwork universe).[7] The opposite is true in Islam since this regularity is a sign of His wisdom and Will ruling over the universe and as proof of His existence, (*Qur'ān*, *Ar- Ra'd*: 2).

Bil-Mizan: Polysemous word

In the Exegesis of the Qur'an: *Ar-Rahman*: 7-9, Hussein[8] explained the polysemous nature of '*Bil-Mizan*'.

وَٱلسَّمَآءَ رَفَعَهَا وَوَضَعَ ٱلْمِيزَانَ ۝٧ ۝٨ ٱلَّا تَطْغَوْا۟ فِى ٱلْمِيزَانِ

[7] Dolnick, Edwards. The Clockwork Universe: Isaac Newton, the Royal Society, and the Birth of the
Modern World, Harper Collins, 2011.

[8] Hussein, A.R. Schools of Qur'anic exegesis: Genesis and development. Routledge, pp.173-174, 2010

وَأَقِيمُوا۟ ٱلْوَزْنَ بِٱلْقِسْطِ وَلَا تُخْسِرُوا۟ ٱلْمِيزَانَ ۝٩

This verse can be translated as: 'He has lifted the sky, and measure is set. Do not exceed the balance and measure accurately' Hussein said, "The noun, *Al-Mizan,* is repeated three times without the co-referential pronoun in the second and third *ayah*s".

A co-referential pronoun cannot replace the expression to get: '*al-sama'a rafa'aha wawada'a Al-Mizan alla tatghaw fihi .... wala tukhsiruhu* [And the sky He hath uplifted; and He hath set the measure, That ye exceed not the measure by it … and ... do not make it deficient] where there are the co-referential pronouns –hi(it) and –hu (it) attached to *fihi* and *tukhsiruhu* in the second and third *ayah*s, respectively, and which refer to the same noun, *Al-Mizan*. Although this alternative stylistic structure is grammatically sound, it distorts the meaning of the original *ayahs Qur'ān*, *Ar-Rahman*: 7-9. The major reasons for the repetition of the noun *Al-Mizan* and the non-occurrence of co-preferentiality are attributed to the following semantic factors:

- Those three *ayahs* have been revealed at different times and not as a unit during one circumstance of revelation
- The expression (*Al-Mizan*) is a polysemous word that has three different meanings:
    a. In Q55:7, it means '*I'tidal Al-insan* [the straight erection of man's body], that is '*bunyat Al-insan'* (the physical shape of the human being]
    b. Q55:8 means, '*Al-hukum bil-'adl'* (to judge (rule) with justice) and
    c. In Q55:9, it means that. '*Al-wazn*' (the balance) is the tool used for weighing.

Apart from three verses, there are 17 other verses where *Bil-Mizan* is mentioned.

Table 1. Qur'anic verses with '*Mizan*'

1) *Al-An'am* [6]:152	10) *Al-Mu'minin*[23]: 102
2,3) *Al-A'raf* [7]: 8	11) *Al-Mu'minin*[23] : 103
4) *Al-A'raf* [7]: 85	12) *Asy-Syu'ara'*[26]:182
5) *Hud* [10]: 84	13) *Ash-Shura* [42] :17
6) *Al-Hijr* [15]: 19	14) *Al-Hadid* [57]: 25
7) *Al-Isra'*[17]: 35	15) *Al-Muthafifin*[83]:3
8) *Al-Kahfi*[18]: 105	16) *Al-Qari'ah*[101] : 6
9) *Al-Anbiya'*[21]: 47	17) *Al-Qari'ah*[101] : 8

Criterion of Truth

The meaning of balance goes much beyond the physical measure of goods. *Mizan* refers to the criterion of truth and falsehood and the aspect of justice. There is sometimes a thin line between justice and injustice. "Allah is the One who has sent down the Book with truth, and the Balance as well." (*Qur'ān*, 42:17).

Mizan indicates the golden balance in all spheres of life, highlighting the importance of rationale. The Almighty runs the earth and the entire universe with a perfect balance in every sphere of vast expanse. The whole system of the practical life of human beings is established with justice, elucidated throughout the *Qur'ān*. Justice is the culmination of all virtues.[9] While dealing with people in various life processes, we must nurture our conscience with Allah's thoughts and the Day of Judgment. His entire life system would be constructed on justice or within the limits of justice, demonstrating the right balance (*Mizan*) of principles, morals, and dealings after the Message of Monotheism (*Tawḥid*), sending Prophets aimed to establish a system that offers individual and collective justice within every community. This system has to start from an individual in society.

Bil-Mizan: Balance, Sustainability and Justice

In engineering, a fundamental concept when forces are dealt with is the idea of equilibrium or balance. Generally, several forces can act

[9] Al-Atas, S.M.N. Islam and Secularism. (Kuala Lumpur: ABIM), 1978.

on an object at the same instance of time. A force has magnitude and direction. Two forces are equal when they have the same magnitude and direction. The net force is the vector sum of all the forces acting on a body. If the net force equals zero, it is deemed in equilibrium. In the case of zero net force acting on an object in equilibrium, the object continues to move at a constant speed (zero acceleration), from Newton's first law of motion. The forces acting on a body are in equilibrium when the body is at rest or moving at a constant velocity. In practical terms, it means that for forces in equilibrium, the sum of the components of the forces in any direction must be zero.

(a) Mathematical Balance of Forces

A balance occurs when the centrifugal force balances gravity at an appropriate speed. The speed is 30 km/second when the Earth orbits around the Sun.[10] If it is slowed down for some reason, the centrifugal force (which depends on the square of the velocity) will decrease. Gravity, however, maintains its strength, not falling inwards to the Sun, although as it moves inwards, gravity gets more substantial because of Allah's law of conservation of angular momentum.

The angular momentum of a moving object, L in a circular orbit is L= mvr.

This is conserved, so v $= \frac{L}{mr}$, i.e. v is inversely proportional to r.

Now

centrifugal force is $F_c = \frac{mv^2}{r}$ (page 155)[11]

[10] Pogge.R. An Introduction to Solar System Astronomy, Retrieved Sept 23, 2020, http://astrpnomy,ohio-state,edu/

[11] Young, H.D. and Freedman, R.A. University Physics with Modern Physics. 13th. Edition, Addison-Wesley, 2012

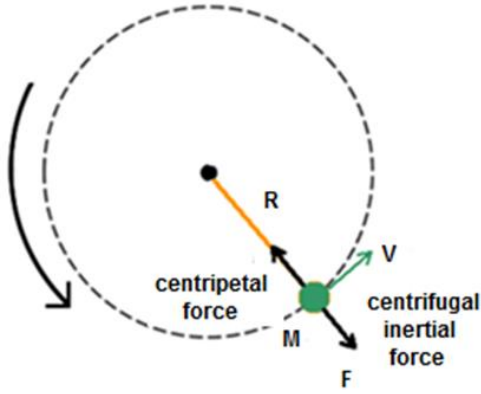


Figure 1: Balance of Forces

It is proportional to $\frac{v^2}{r}$. Substituting for $v^2 = \frac{L^2}{m^2r^2}$,

it becomes ($F_c = \frac{mL^2}{m^2r^3}$) so F_c is proportional $\frac{1}{r^3}$.

Then, the centrifugal force is proportional to the inverse cube of the radius.

The gravitational force (F_g = G $\frac{m_1m_2}{r^2}$) so F_g is proportional to $\frac{1}{r^2}$.

Thus, gravitational force is proportional to the inverse square of the radius.

Gravity increases as an object with a given angular momentum moves inwards, but the centrifugal force increases quickly. Thus, it can be deduced that gravity will once again balance the centrifugal force at some point. So, orbits are stable; although disturbed, they will get into balance.[12]

[12] MSO. Orbits, Mount Stromlo Observatory. Australian National University, Retrieved Sept. 24 2020 at http://www.mso.anu.edu.au/~pfrancis/roleplay/MysteryPlanet/Orbits/2018.

(b) Duly-Balanced (Sustainability)

Sustainability is achieved when a balance exists between the people (society), the economy and the environment. Sustainable development is carried out by meeting the needs of the present society without losing track of the needs of the future generation.[13] Society decides the objective for development and sets ethical and value frameworks. The economy is structured to meet goals and values set by society. The environment sets the limit. Societal sustainability involves informed citizenry, stakeholder participation, justice, equity, and consumer choices, as well as providing opportunities for valuable and productive lives. Allah has set all things in due balance. "And the earth We have spread out; set thereon mountains firm and immovable, and produced therein all kinds of things in due balance" (Qur'an: *Hijr*: 19).

(c) *Bil-Mizan* as Principle of Justice *('Adl)*

The third meaning of *Mizan* is justice. Essentially, this is an extension of the first two meanings. It goes beyond mathematical balance and sustainability. Justice ('*Adl*) means to place all things in their correct positions.[14] Justice is a condition of things being in their proper places.

As remarked by Sir Hamilton Gibb (1895-1971), justice is a principle of order and wholeness, putting all things properly in their sense of purposes in a divinely governing system. Another scholar, Fakhr *Al*-Dīn *Al*-Rāzī, defined justice as "when all the powers of the soul are put in their proper places or exist in a state of moderation, far from either excess or deficiency, the man then will achieve justice which ultimately leads to virtuous acts and happiness". [15]

According to Al-Attas, justice is to place all things in their correct positions in our minds. Knowing where things are in their proper positions means keeping them in due balance. In other words,

[13] Bruntland, G. Our Common Future. United Nations World Commission on Environment and Development (WCED). Oxford University Press, 1987.

[14] Al-Attas, S.M.N. On Justice and The Nature of Man: A Commentary on Surah al-Nisa and Surah al-Mu'minun. Kuala Lumpur: IBFIM, 2015.

[15] Riswanto, A.M. Fakhr Al-din Al-Razi on justice, unpublished M. Phil. Thesis, UTM. 2016

to keep things duly balanced is to achieve justice. One who subscribes to this stance will have the '*Adab*'. Adab is a reflection of wisdom acting in conformity with wisdom. Wisdom tells us about the proper places for everything in our minds. Conditions where everything is in its proper place are justice.

One of the names of Allah, '*adl',* means "utterly just".[16] One will be rewarded or punished based on his '*Ama*l' (deeds). The word *'adl'* was initially meant to convey the idea of making two things equal. 'Equity' or 'justice' emanates from the concept of equal distribution, and as a result, '*Adl*' came to denote 'Justice'. 'Equity' is to be the 'exact standard neither less nor more' and to keep everything in its proper place. He said, 'The doctrine of the Divine Names contained in the Qur'ān in itself the basis of all Islamic cosmology, and it is enough to study in-depth the significance of the meaning of the Divine Names to understand not only the relation of the cosmos to Allah SWT but the very structure of the universe as so many interplays of the theophanies and reflections of the Divine Names and Qualities.'

The theophanies are the visible manifestations of Allah SWT to humans. Accordingly, for the reasons explained subsequently, the two names of Allah's 99 names that will be adapted in developing the governing model will be Al-Khaliq (the Creator) and Al-'Adl (Utterly Just).

Methodology

Exploratory Sequential Design

This mixed-method research is a two-phase design that includes collecting and analysing the qualitative data in the first phase.

First phase

This work follows the Straussian school of thought in the academics' semi-structured interview. Among its differences from Glaser's are that the interview starts with having a general idea of where to begin, forcing the theory with structured questions, and structuring the data

[16]Ilai, R. 99 Names of Allah meaning. Retrieved Sept. 24, 2020, at https://www.pray.net.pk/99-names-of-Allah-meaning/, 2020.

to reveal the theory. The research continues until no new evidence could inform or underpin the development of the emerging theory's theoretical points, the theoretical saturation point. Once saturation is reached, the theory is grounded in the data.[17,18]

Since the grounded theory approach was adopted, the primary field interview was conducted by interviewing thirty academics with the ranks of Professors. Participant Number 30 reached the theoretical saturation point. The pilot and main interview period lasted almost a year, from April 9 to March 2, 2020. It was intermittently conducted to fit within the respondents' busy schedules.

Second Phase

Quantitative data were collected from these initial exploratory results, namely the mastery and humility theory. The data analysed in the second stage is to determine the convergence of mastery and humility. During the first phase, semi-structured interviews were conducted to generate two qualitative data types: interviewer field notes and interview transcripts. Thematic analytic procedures of NVivo[19] are used to identify several dimensions from the qualitative data set.

After creating the instrument from the qualitative findings, the second phase, quantitative research, follows using SPSS Amos.[20] As depicted in Figure 2 below, the design begins with qualitative data collection and analysis to explore a phenomenon (the first two boxes of the diagram). An instrument is developed at the interface (note the 'develop an instrument' oval in Figure 2). This instrument is used to collect the quantitative data in the second phase (the following two boxes in the diagram), and the conclusion can be drawn from what can be deduced from the two phases.

In this work, the mastery indicator is accomplished in the Integrated Design Project (IDP) for several reasons in all accredited

[17] Charmaz, K. Constructing grounded theory: A practical guide through qualitative analysis, 2nd. Ed., SAGE, 2014.

[18] Urquhart, C. Grounded Theory for Qualitative Research: A Practical Guide, 2013.

[19] QSR International Pty Ltd, NVivo Qualitative Data Analysis, Version 12, 2020.

[20] Arbuckle, J.L. Amos (Version 23.0) [Computer Program]. Chicago, IL: IBM SPSS, 2014

engineering programmes. Integrated Design Project Course/Capstone Design Project indicates the disciplines' competency.[21] Both universities (X and Y) offer Integrated Design Projects (IDP) in the Final Year (Semesters 7 and 8). It is the very essence of enabling and culminating courses. Enabling Courses (EC) are the courses that help develop and nurture the intended outcomes at the course level and build up the body of knowledge for that particular engineering field. Culminating Courses (CC) are the highest-level courses demonstrating the flow of knowledge through the semesters accumulated.

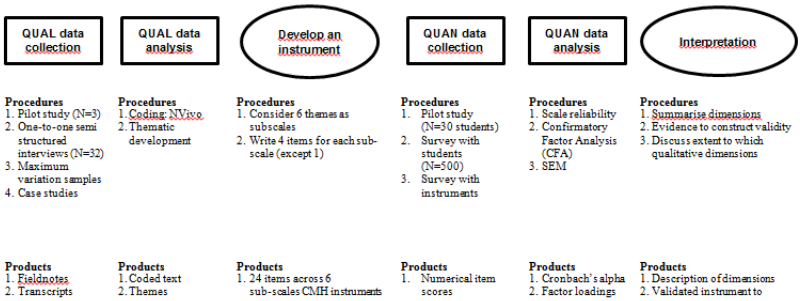


Figure 2: Sequential Exploratory Design[22]

Convergent Mastery-Humility Model Development

The proposed Convergent Mastery and Humility Model (CMH) is derived from the governing concept of *Bil-Mizan* emanating from *Tawḥid.* The doctrine of *Tawḥid* will be the principle for the proposed model. The *Tawhid* category of *Tawhid Al-Asma Wa-Sifaat*, or the unity of Allah's name and attribute, is considered here. The names of Allah, *Al-Khaliq,* and *Al-Adl* are chosen due to their significance in the convergence of mastery and humility. The latter, *Al-Adl*, dictates the correct positions of all things,

[21] Engineering Accreditation Council. Engineering programme accreditation standard. Retrieved August 1, 2020, from http://www.eac.org.my/web/document/pdf.

[22] Creswell, J.W, and Plano Clark, V. Designing and conducting mixed-methods research. (2nd. Edition), Thousand Oaks, CA: Sage, 2011.

and *Al-Khaliq* causes the unity of *Ummah*, nature and man. Emanating from *Tawhid* is *Bil-Mizan*, the governing concept for balance, thus assuring stability and, therefore, *Al-Adl*.

The steps and procedure for developing the Convergent Mastery-Humility model are as follows:

1. Adoption of *Tawḥid* as the governing principle in Science and Engineering.
2. Selection of Allah's names, *Al-Khaliq* (Creator) and *Al-'Adl* (Utterly Just), for enabling and culminating courses in an engineering curriculum.
3. Both names are utilised optimally in the Integrated or Capstone Design Project course.
4. Evaluate the Mastery scale as *Khalifah* (Vicegerent) and adopt the sustainable design approach.
5. Assess the Humility scale as *Ubuddiyyah* (Servitude) and ethics as *Akhlaq* (disposition)
6. Using the Straussian Grounded theory (GT) approach, the theory on the Convergent mastery-humility model emerged upon reaching the theoretical saturation point after the constant comparative analysis involving concurrent data collection, generation and analysis at every interview stage.
7. A secondary source, namely document analysis, will further help in exploring the data for the emergent theory and later forming the constructs
8. A measurement model is obtained Using Confirmatory Factor analysis (CFA).
9. The latent variables, mastery and humility, will be validated by the Structural Equation Model (SEM) in the survey done with the larger population (students).
10. With the 'best fit' model from SEM, data analysis from the interviews and document analysis, the theory is then truly grounded in the data

Results and Findings

The research approach is a sequential exploratory design, combining qualitative and quantitative research methods, the 'QUAL-quant' approach. Data were collected by semi-structured interviews using

the grounded theory approach, questionnaires, surveys, and document analysis. The data from the semi-structured interviews, the core qualitative component, were weighed more until saturation. Confirmatory Factor Analysis (CFA) was used to test how well the measured variables represent the constructs. The structural equation model (SEM) analysed the structural relationship between the measured variables and latent constructs.

Six constructs with 24 items were developed for the main questionnaire, receiving 507 responses. Using SPSS Amos, the construct validity achieved CFI .963≥.95, TLI .956≥.90 and RMSEA .068≤.08. Upon verifying the measurement model, SEM then confirmed the theoretical proposition that mastery and humility formed the converging variable (Table 2).

Table 2. Fit Indices (CMH Model)

Test	**X2/df**	**RMSEA**	**CFI**	**IFI**	**TLI**	**PNFI**
Value	<4	≤.08	≥.95	≥.90	≥.90	≥.05
Final CMH Model	3.31	.068	.963	.963	.956	.793

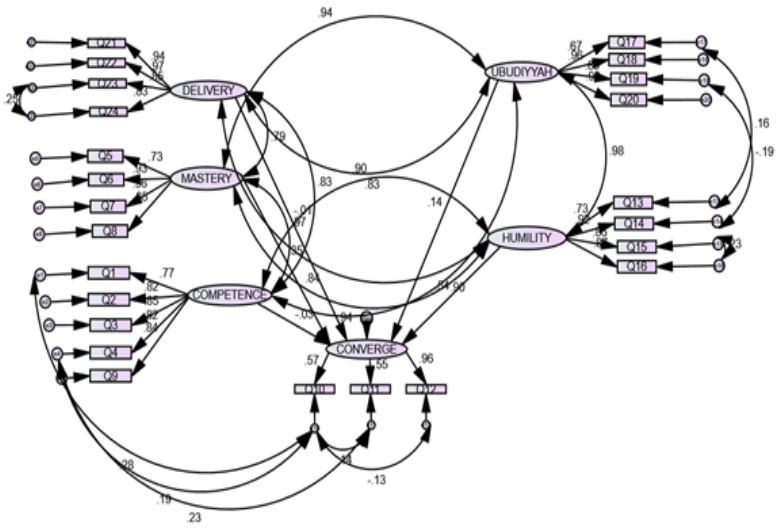


Figure 3: Causal/Effect Modelling

Discussion

This work seeks to fill the void in the engineering curriculum concerning the spiritual dimension in the science and ethics presently modelled after the West's worldview. It also aims to halt the perpetuation of dualism and secularism. Islamic Science and *Akhlaq* replace the secularised science and ethics, respectively governed by the Doctrine of *Tawḥid*, which is reorganised intellectually utilising the *Bil-Mizan* concept.

The Islamic science adopted is the scientific enquiry merging with the strength of philosophical wisdom. It uses metaphysical instead of epistemological or Bucaillism. The metaphysical view of science considers every scientific activity operating within a metaphysics framework whose principles are derived from the Divine revelation's immutable teachings. The *Bil-Mizan* concept emanating from *Tawḥid* uses the verses of the noble Qur'ān extensively to transcend from physical to metaphysical. The polysemous word Bil-Mizan means equilibrium, duly balance and justice.

Validity and Reliability:

The quality of study in qualitative research is indicated by validity rather than reliability. Validity in qualitative research refers to 'the honesty, depth, richness, and scope of the data achieved, the participants approached and the disinterestedness or objectivity of the researcher'.[23] The researcher carefully sieved the respondents' views to remove subjectivity and biases. The respondents' views must be theirs alone. Various data were collected to minimise such an effect, and so as not to appear biased, the respective respondents checked the findings. After each session, the discussion summary was read to them for approval.

The questionnaire responses were analysed based on reliability, confirmatory factors for validation, and correlational hypothesis testing to establish construct validity. The data obtained from the survey instrument were assessed by Cronbach's alpha for its validity and acceptability. A point of interface occurred by

[23] Cohen, L., Manion, L. and Morrison, K. Research methods in education, (5th. ed.). London: Routledge, 2000.

connecting the instrument (CMH) developed in the initial qualitative phase to the quantitative phase. The Alignment and the Convergent M-H were analysed from these two phases. Then, the emergent theory was validated, underpinning a monotheistic (*Tawḥidic*) Engineering Curriculum.

Humility

It is argueably that studying engineering can boost one's self-confidence. However, if left unchecked, such confidence can turn into arrogance. Humility will balance this trait. It is a small part of *Akhlaq* (disposition). He needs to balance this egoistic trait with humility and be mindful of his role as His vicegerent. His *Akhlaq* should demonstrate the practical implications of his faith.

True humility is knowing the full extent of their worth before Allah SWT's Majestic Forbearing. They then make this fully realised potential an embedded, essential part of their nature. Whosoever has done this is humble and at ease in their relations with others; those who have realised their nothingness before the Almighty are balanced in their religious lives and their synergy with people. They obey the decrees of religion, submit to the revealed truths of faith, and accept its method of addressing or relating to human reason. They are convinced of the truth in the *Qur'ān* and the legitimate Traditions of the Prophet…. "Only the ones with knowledge fear Allah, the most among His servants. Indeed, Allah is Majestic in Might and Forgiving" (*Qur'ān*, Fathir: 28).

Significance of the Findings

The work here is that the emergent theory on convergence comes from considering the phenomenon of mastery and humility coming together and meets at the premise of *Al-'Adl* (justice). As defined earlier, justice is to place all things in their correct positions. Justice is a condition of things being in their proper places. At this 'point', to be at the correct position, the balance *Bil-* Mizan is achieved and thus stable. It can be a physical balance, such as the equilibrium of forces, or a duly balance, such as the case of sustainability. Allah SWT causes it as *Al-Khaliq* to stay stable. Man's correct position is in his '*sujud*' (prostration) state of condition. This physical position

of submission is accompanied by the complete submission of all in the name of Allah SWT (*Ubudiyyah*). Thus, convergence occurs when Allah SWT exerts Himself as *Al-'Adl* and *Al-Khaliq*. It is depicted in Figure 4 below.

Figure 4: Convergence Mastery-Humility Model

Is Meaning Cognised?

The meaning is related to being an *Abd,* one with humility. This is explicitly expressed as

> "…and I did not create the jinn and humankind except to worship Me." (51:56)

This is the real meaning guiding the purpose of our being on this earth. Having humility means realising one is in the *Ubudiyyah* capacity, which is the meaning of our existence.

As explained above, the affective (humility) and cognitive (mastery) domains meet at the state of *'Al-'Adl.* Thereby elevating one of the 99 names of Allah SWT. It was stated that a humble person will respect the truth wherever it comes from. Searching for the truth means looking at patterns of the Almighty's creations, which requires cognitive capacity and means. To acquire mastery over and above competency, for instance, necessitates cognisance of the various signs in nature, that is, the ability to analyse, rationalise, and bring to a logical conclusion on His creation, that is, perfection, as emphasised in Verses 3 and 4 of Al-Mulk.

In the state of *Al-'Adl*, all things are in their correct positions. The proper condition for stability is balance or equilibrium, whichever is appropriate and requires cognitive capacity. The correct position of man is in the sujud position, *Ubudiyyah.* The submission is physical, and the man's submission is total. This meeting point of convergence may lead to integration since the meaning is cognised.

Therefore, at this stage, integration can take place between cognitive and affective constituents since they are operating in the same phase, not between matter and non-matter. In other words, convergence makes integration possible. It is a two-step process rather than an abrupt integration or an add-on between acquired and revealed knowledge.

Conclusion

The inquiry was driven by three research questions using the Sequential Mixed-Methods Exploratory Design and steered by the Straussian grounded theory approach involving qualitative and quantitative surveys. Respondents include staff and students of two local universities. Two novelties are proposed in this study: (a) Theoretical development of *Bil-Mizan*, emanating from *Tawḥid*, as the governing concept in the equilibrium of forces in engineering and the duly balance in sustainability concerning moon-earth-sun configuration and (b) Developing the Convergent Mastery-Humility model based on this theoretical proposition.

Based on the theory, mastery and humility are initially coupled, uncoupled, and then allowed to converge at a meeting point. The convergent mastery-humility model (CMH) is established following the dictation of Allah SWT as '*Al-'Adl'* (justice), the condition when all things are in the correct position, in other words, the balanced setting as in physical and duly balanced are in their proper position. The correct position of man and Society is the sujud (prostration) posture for the former and '*amal makruf nahi mu*ngkar' (enjoining the good and forbidding the evil) for the latter. The model is calibrated with looped confirmatory factor analysis (CFA) and verified by causal Structural Equation Modelling (SEM). This CMH model can be used in the rubric as the measurement model of both the affective (to measure humility) and cognitive (to measure

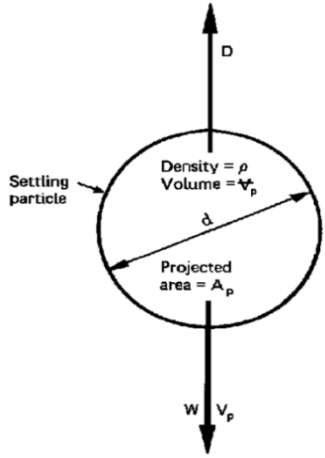
Mastery) domains in the engineering curriculum underpinned by the *Tawḥidic* (monotheistic) doctrine.

Recommendation

Hopefully, this model can be used and propagated to put a brake on the perpetuation of dualism and secularisation in all engineering curricula. It is also believed that this work can invigorate the Islamisation of Knowledge effort and be comprehended by the present and future engineers to translate into actions for the Ummah to regain its lost grounds. The findings, in no small measures, will guide the teaching of the subject matters to extend beyond the Creator-Created (*Al-Khaliq*) domain to *Al-ʻAdl,* which opens doors for endless possibilities as illustrated by the deliberation on the flocculent settling phenomenon (dynamic condition) and bar reinforcement detailing (static condition) (Appendix).

Appendix

(a) Dynamic condition (sum of forces # 0): Colloid settling in quiescent Condition



Forces Acting on a Settling Particle (Colloid)

The submerged Weight of the particle

$$W = (\rho - \rho_l) g V_s$$

The Drag Force, acting opposite to the relative motion of the particle,

$$D = C_D \rho_l A_p \frac{v^2}{2}$$

where, $\rho =$ density of particle, ρ_l = density of liquid, V = volume of the particle
v = velocity, A_p = cross-sectional area of the particle and C_D = Newton Drag coefficient

The particle will decelerate until at some point where there is a balance of forces, (*Al-'Adl*), $\boldsymbol{\Sigma}$ F = 0

When acceleration = 0, the settling velocity will be constant, and Allah the *Al-Khalik* (Creator) will dictate it.

Equating D = W

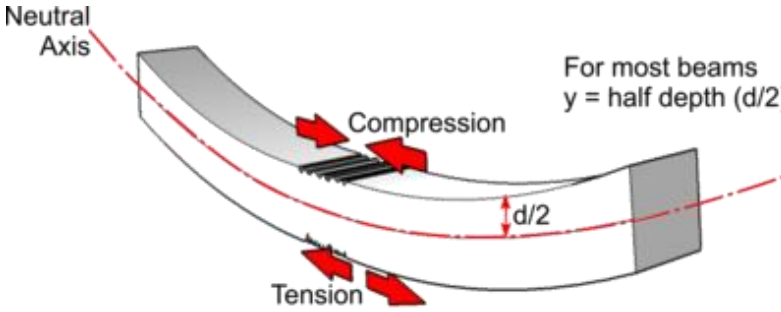
$$C_D \rho_l A_p \frac{v^2}{2} = (\rho - \rho_l) g V_s$$

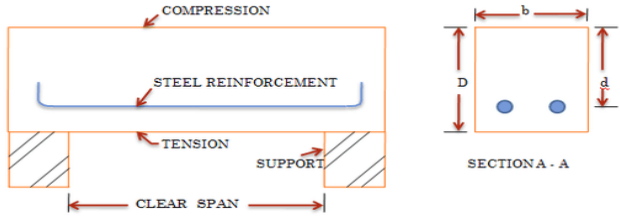
Rearranging and substituting it can be shown in quiescent condition.($R_e < 1$), that this constant velocity is $v = g\frac{(\rho - \rho_l)}{18\mu} d^2$.

It was determined by George Gabriel Stokes (1819-1903).

The equation can be used to design settling tanks of several configurations and in soil mechanics to determine the size of particles in the Jar/Column Settling test.

(b) Static conditions (sum of forces = 0): Bar reinforcement





Reinforcement in the simply supported beam
(Proper placement for equilibrium)

فَأَيْنَمَا تُوَلُّوا۟ فَثَمَّ وَجْهُ ٱللَّهِ ۚ إِنَّ ٱللَّهَ وَٰسِعٌ عَلِيمٌ ﴿١١٥﴾

"…Wherever you turn, you are always in the presence of God. For Allah is all-pervading, all-knowing." (Al-Baqarah 2:115)

AL-SHAJARAH

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