

6.0 DEVELOPMENT, VALIDATION AND FEASIBILITY OF A SCHOOL-BASED SHORT DURATION INTEGRATED CLASSROOM YOGA MODULE: A PILOT STUDY DESIGN

6.1 RATIONALE FOR DEVELOPING A SHORT DURATION INTEGRATED CLASSROOM YOGA MODULE

Despite awareness of the benefits of *yoga* in children's education, most schools either have not incorporated the practice of *yoga* in the school curriculum or have done so sub-optimally, usually one class a week. The reasons range from lack of time, a packed curricular and co-curricular schedule, the need for resources like *yoga* rooms, mats and trained instructors. If a solution can be found to overcome these problems to include *yoga* in the daily school schedule, it will be of immense benefit to children.

Further, the practice of *yoga* in the classroom has been recommended by Yogabhakti Sarasvati (Satyananda, 1990). The reasons provided by her are: (i) The job of a teacher is a tiring one and, by practicing *yoga*, the teacher can regain energy. (ii) The *yogic* vision of education works towards a higher purpose to attain human evolution. To achieve this goal, the teacher can use the practice of classroom *yoga* to create an atmosphere of calm enjoyment. (iii) *Yoga* in the classroom can help children to utilize all their senses in the pursuit of learning. (iv) Classroom *yoga* can create the right balance between extroversion and introversion. (v) It tunes the teacher to recognize different types of attention in the cohort.

To help schools incorporate *yoga* in their daily schedule, the problems of time and resources need to be addressed. A short duration Integrated Classroom Yoga Module (ICYM), if found feasible and efficacious, can potentially be incorporated in the daily school schedule. It can be practiced during the first period of the day in the classroom environment. The module can be led by the class teacher after a short training. Since the module takes 12 minutes to practice, school managements may not consider it an intrusion into their academic schedule. The objective, therefore, was to develop a validated short duration ICYM that can be easily incorporated in the daily school schedule.

6.2 METHODS

6.2.1 PHASES IN DEVELOPMENT AND VALIDATION OF THE MODULE

To design, validate and confirm the feasibility of the Integrated Classroom Yoga Module (ICYM), a phased methodology, as shown in Figure 11, was followed.

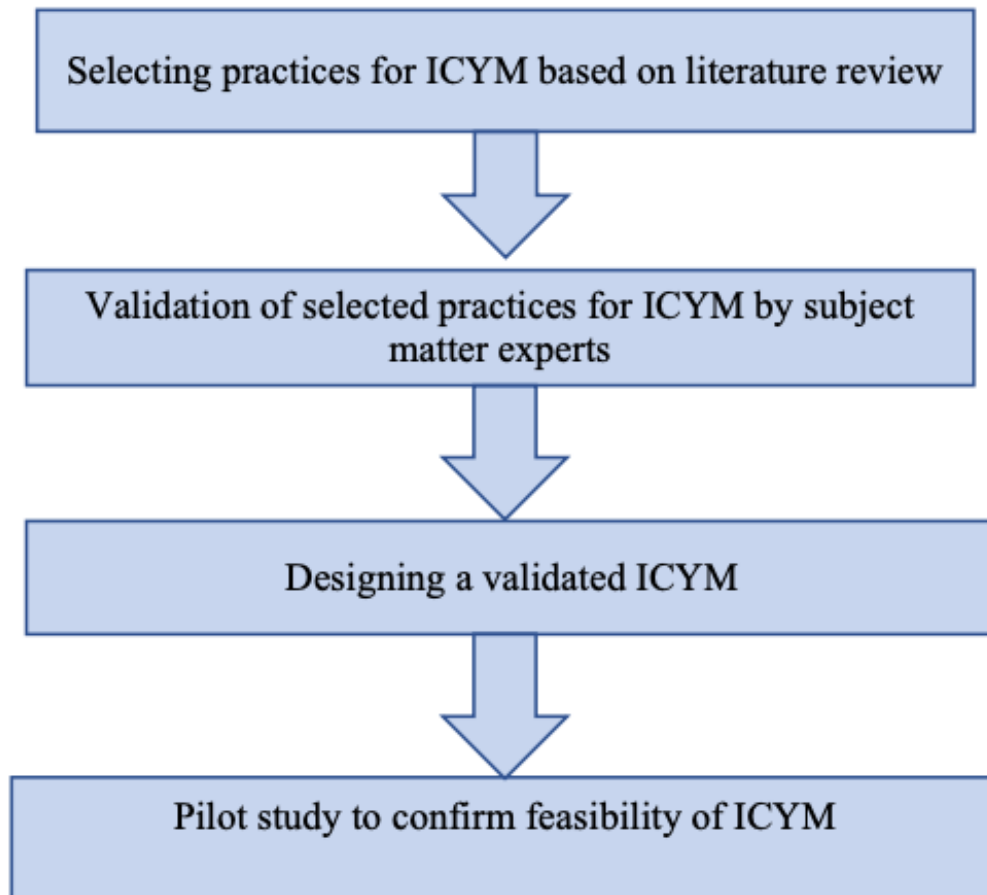


Figure 11 - Phases in Developing a Validated School-Based Short Duration ICYM

6.2.2 SELECTING PRACTICES FOR ICYM BASED ON LITERATURE REVIEW

Ancient and contemporary texts of *yoga* were reviewed to develop the content of the module. These were *Pātanjali Yoga Sutra* (Kothandaraman, 2009; Vivekananda, 2012), *Hātha Yoga Pradipikā* (Muktibodhananda, 2012), *Gherānda Samhitā* (Niranjananda, 2012), *Siva Samhitā* (Vasu, 2012), *Svetasvatara Upanishād* (Tejomayananda, 2011) and *Brhdāranyaka Upanishād* (Madhavananda, 1934). The contemporary texts reviewed were *Light on Yoga* (Iyengar, 2012),

Āsanā Prānāyama Mudrā Bandhā (Satyananda, 2009) and Integrated Yoga Therapy for Positive Health (Nagarathna & Nagendra, 2011). Tables 1, 2 & 3 give the *āsanā*, *prānāyama*, meditation and *mantrā* chanting practices shortlisted for inclusion in the module.

Table 1: Āsanā (Physical Postures) Shortlisted from Literature Review

Āsanā (Physical Postures)	Benefits	Textual References
Sideways bending/twisting		
Katichakrasana	Tones upper body; corrects posture; relieves stress	Asana Pranayama Mudra Bandha. Satyananda (2009)
Tirikaya Tadasana	Exercises & balances side muscles	Asana Pranayama Mudra Bandha. Satyananda (2009)
Ardhakati Chakrasana	Stimulates sides & spine; improves liver function	Positive Health. Nagarathna & Nagendra (2011)
Parsvakonnasana	Tones lower body; increases peristaltic activity	Light on Yoga. Iyengar (2012)
Forward & backward bending		
Prasarita Padohastasana + Ardchakrasana	Develops lower body muscles; improves flexibility, increase blood flow to head region	Light on Yoga. Iyengar (2012)
Padahastasana + Ardchakrasana	Tones abdomen; improves digestive health; improves metabolism, improves concentration	Light on Yoga. Iyengar (2012) Positive Health. Nagarathna & Nagendra (2011) Asana Pranayama Mudra Bandha. Satyananda (2009)
Padahastasana + Hastauthanasana	Tones abdomen; improves digestive health; improves metabolism, improves concentration	Light on Yoga. Iyengar (2012) Positive Health. Nagarathna & Nagendra (2011) Asana Pranayama Mudra Bandha. Satyananda (2009)
Stretching		
Tadasana	Lightness; mental agility; physical & mental balance; tones nerves	Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009)
Parivritta Trikonasana	Tones lower body; invigorates abdominal organs; stimulates nervous system	Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009)
Gaumukhasana	Tones upper body; regulates endocrine system; regulates prana flow; steadies body & calms mind, increases energy & awareness	Hatha Yoga Pradipika. Muktibodhananda (1985) Gheranda Samhitā. Niranjananda (2012) Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009)
Ardhachandrasana	Strengthens lower body & abdomen; improves digestion; improves balance	Gheranda Samhitā. Niranjananda (2012) Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009)
Balancing		
Vrkshasana	Improves balance; strengthens lower body; promotes kidney health	Gheranda Samhitā. Niranjananda (2012) Light on Yoga. Iyengar (2012) Gheranda Samhitā. Niranjananda (2012)

Garudasana	Strengthens & loosens body; tones nerves, develops concentration	Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009)
Veerbhadrasana Pose III	Creates harmony & balance; tones abdomen; gives vigor; improves concentration	Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009)

Table 2: Prānāyama (Breathing Exercises) Shortlisted from Literature Review

Prānāyama (Breathing Exercises)	Benefits	Textual Reference
Bhastrika	Stimulates cerebral region; strengthens nervous system; oxygenates blood; stimulates heart; detoxification; unblocks prana movement; stimulates metabolism; lowers stress; induces clarity of thought and improves concentration	Hatha Yoga Pradipika. Muktibodhananda (1985) Gheranda Samhitā. Niranjananda (2012) Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009)
Ujjai	Relaxes; develops psychic sensitivity; internalizes the senses; calms the mind; promotes cardio and digestive health	Hatha Yoga Pradipika. Muktibodhananda (1985) Gheranda Samhitā. Niranjananda (2012) Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009)
Yogic breathing (abdominal)	Relaxed & comfortable breathing; gives vitality & calmness; clarity of thought	Asana Pranayama Mudra Bandha. Satyananda (2009) Positive Health. Nagarathna & Nagendra (2011)
Nadi Shodhana	Purifies nadis; increases prana capacity; eliminates bodily disorders; makes breathing rhythmic; soothes nerves; stills the mind; balances brain hemispheres; improves concentration	Hatha Yoga Pradipika. Muktibodhananda (1985) Gheranda Samhitā. Niranjananda (2012) Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009) Positive Health. Nagarathna & Nagendra (2011)
Sheetali & Sadanta	Cools the body & mind; keeps teeth & gums healthy; harmonizes the endocrine system; reduces BP; encourages flow of prana; gives vigor; gives inner tranquility	Hatha Yoga Pradipika. Muktibodhananda (1985) Gheranda Samhitā. Niranjananda (2012) Light on Yoga. Iyengar (2012) Asana Pranayama Mudra Bandha. Satyananda (2009) Positive Health. Nagarathna & Nagendra (2011)
Bhramari	Awakens psychic sensitivity; relieves anxiety; alleviates anger; reduces BP; helps in throat ailments; creates healing capacity	Hatha Yoga Pradipika. Muktibodhananda (1985) Gheranda Samhitā. Niranjananda (2012) Asana Pranayama Mudra Bandha. Satyananda (2009) Positive Health. Nagarathna & Nagendra (2011)

Table 3: Dhyāna (Meditation) & Mantrā (Chanting) Practices Shortlisted from Literature Review

Dhyāna and Mantrā Practice	Benefits	Textual Reference
Dhyāna (Meditation) Mauna	Control over mind; stillness, one pointedness, continuous awareness; deep relaxation; reduced metabolic rate; light & expansive feeling	Patanjali Yoga Sutra. Vivekananda (1986) Hatha Yoga Pradīpika. Muktibodhananda (1985) Gheranda Samhitā. Niranjananda (2012) Positive Health. Nagarathna & Nagendra (2011)
Mantrā (Chanting) OM & Gayatri Mantras	Steadies the senses and quietens the mind; balances the emotions; purifies the mind	Svetasvatara Upanishad. Tejomayananda (2011) Brhadaranyaka Upanishad. Madhavananda (1934) Positive Health. Nagarathna & Nagendra (2011)

6.2.3 VALIDATION OF SELECTED PRACTICES FOR ICYM BY SUBJECT MATTER EXPERTS

The 24 practices shortlisted from literature review were used to create 4 alternate *yoga* practice sets meant to be rotated from one day to the next. A questionnaire was prepared for *yoga* experts. They were required to validate the practices on a three-point scale:

1. Not essential: has no role in improving physical, cognitive or emotional well-being of school children.
2. Useful but not essential: useful but not important in improving physical, cognitive or emotional well-being of school children.
3. Essential: very important for improving physical, cognitive or emotional well-being of school children.

The questionnaire further required them to rate the *yoga* module, as a whole, on its ability to achieve the objectives of impacting physical, cognitive and emotional well-being of school children. The rating was on a three-point scale:

1. Not at all
2. Moderately
3. Very much

Open ended suggestions for improvement were also solicited in the questionnaire.

The experts were selected based on convenience sampling. 21 *yoga* experts responded to the questionnaire. Lawshe's Content Validity Ratio was the statistical tool employed to analyze the data (Ayre & Scally, 2014).

6.2.4 DESIGNING A VALIDATED INTEGRATED CLASSROOM YOGA MODULE (ICYM)

Definition of ICYM

The premise worked on was that a short duration *yoga* module, amenable to be led by the class teacher and possible to practice in the classroom, will encourage schools to incorporate *yoga* in their daily schedule. ICYM is, thus, conceived as a 12 minutes integrated *yoga* module to be practiced in the classroom environment. It can be led by the class teacher after a one week training in the practice and a working theory of *yoga*.

The integrated module includes different limbs of *yoga* namely, *āsana* (physical posture), *prānāyama* practices (breathing exercises), *dhyāna* (meditation) and *mantrā* (chanting). The design had three pre-defined criteria:

1. It is an integrated *yoga* module.
2. The practices can be performed in the limited spaces of the classroom.
3. The choice of practices should have the ability to impact physical health, cognitive performance and emotional well-being.

Designing the ICYM

The validated practices were incorporated in the ICYM. From the open-ended suggestions given by experts, we thought it useful to include a positive affirmation practice. Another suggestion incorporated was to slow down the pace of the practice to ensure that children were not tired. The parameters used to design the module were:

1. The module duration was 12 minutes.
2. Two sets to be practiced on alternate days, to provide variety and derive more benefits.
3. Start the practice with meditative silence to bring about present moment awareness.
4. Follow with *āsana* (physical postures) comprising side bending/twisting, forward & backward bending, stretching and balancing to exercise the whole body.

5. This was followed by *prānāyama* practices (breathing exercises).
6. At the tail end there was meditative silence and *OM* chanting to relax body and mind.

The module ended with an affirmation.

The ICYM module is presented in Table 4.

Table 4: Integrated Classroom Yoga Module: Set 1 and Set 2 Practiced on Alternate Days

Sl. No.	Set 1			Set 2		
	Yoga practice	Time	Description	Yoga practice	Time	Description
1.	Dhyāna (Meditative silence)	1 min	Sit straight with eyes closed. Attention on breathing. Watch your thoughts flowing	Dhyāna (Meditative silence)	1 min	Sit straight with eyes closed. Attention on breathing. Watch your thoughts flowing
2.	Āsanā Katichakrasana	1 min	20 rounds	Āsanā Ardhakatichakrasana	1 min	Hold for 7 counts on each side
	Hastauthanasana/ Padahastanasana	1 min	3 rounds backward-forward bending. On 4 th round hold for 7 counts on backward bend and then on forward bend	Ardhachakrasana/ Padahastanasana	1 min	3 rounds of backward-forward bending. On 4 th round hold for 7 counts on back bend and then on forward bend
	Tadasana	1 min	3 rounds of up and down followed by 1 round of holding for 10 counts	Gaumukhasana (standing)	1 min	Hold on each side to the count of 10
	Vrkhsasana	1 min	Hold on each side for 10 counts	Garudasana	1 min	Hold on each side for 10 counts
3.	Prānāyama Yogic breathing (Abdominal)	1 min	10 rounds	Prānāyama Yogic breathing (Abdominal)	1 min	10 rounds
	Nadi Shudhi	2 min	6 rounds	Nadi Shudhi	2 min	6 rounds
	Bhramari	1 min	6 rounds	Bhramari	1 min	6 rounds
4.	OM chanting	1 min	6 rounds	OM chanting	1 min	6 rounds
5.	Dhyāna	1 min	Mentally recap the practices. Attention on breathing	Dhyāna	1 min	Mentally recap the practices. Attention on breathing
6.	Affirmation I am a powerful soul	.5 min	3 rounds	Affirmation I am a loveful soul	.5 min	3 rounds
7.	Closing	.5 min	Rub palms, massage eyes, face, neck. With a few blinks open eyes.	Closing	.5 min	Rub palms, massage eyes, face, neck. With a few blinks open eyes.
	TOTAL TIME	12 MIN		TOTAL TIME	12 MIN	

6.2.5 PILOT STUDY TO CONFIRM FEASIBILITY AND EFFICACY OF ICYM

The aim of the pilot study was to test the feasibility of the validated ICYM in a school setting. The design was a paired sample pre-post measurement of physical fitness, cognitive performance, self-esteem, emotional well-being and personality characteristic variables. The intervention period was one month of five days a week practice. The class teachers received a one-week training to lead the module. A video instruction of the program was also given to them. The participants practiced the module at the beginning of the first period of the school day. The inclusion criteria were students belonging to grades 7-10, of both genders, in good physical and mental health with no history of major illness or surgery in the last two months. The school selected was a campus of Samsidh Mount Litera Zee School in Bangalore, India. The study was cleared by the Ethical committee of S-Vyasa University (RES/IEC-SVYASA/145/2019), Bangalore, India. Signed informed consent was obtained from the school principal (dated 10.07.2019).

6.2.6 ASSESSMENT

The assessments were selected with the goal of evaluating (i) physical fitness with 4 tests of the EUROFIT physical fitness testing battery, (ii) cognitive performance related to volitional control over the neuropsychological functions involved in color and word naming responses using the Stroop color-word naming task, (iii) self-esteem measured by Rosenberg self-esteem scale. The variable was selected since it may be associated with other mal-adaptations, (iv) emotional well-being measured by WHO-5 well-being index. This variable was selected since it was a key desired outcome in social emotional learning and (v) personality characteristic as measured by the *triguna* using the Sushruta Child Personality Inventory Scale since it was a measure of tranquility in the personality ((Suchitra & Nagendra, 2013). Statistical Package for Social Science (SPSS) version 26 was used for data analysis.

EUROFIT Physical Fitness Testing Battery:

Developed by the Council of Europe, the EUROFIT fitness testing battery is a simple, inexpensive field test that measures physical abilities. Components of physical fitness were identified by factor analysis to make the test reasonably comprehensive. Test reliability is inbuilt since it was an inclusion criteria. Validation of field tests is not easy since they are not comparable with isometric tests. Despite that, the coefficient of correlation with isometric tests ranged from .43 to .82, where a score of .60 is considered as evidence of validity (Kemper &

Van Mechelen, 1996). Many Indian studies have used the EUROFIT fitness testing battery (Telles, Bhardwaj, Kumar and Balkrishna, 2013; Purohit, Pradhan and Nagendra, 2016; Karkera, Swaminathan, Pais, Vishal and Rai, 2014). Its simplicity, comprehensiveness, reliability and precedence of use in Indian studies are the reasons for its inclusion in this study.

Four tests from the battery were chosen for this study. The assessments were carried out by volunteers who were trained on the methodology and scoring system of the tests. They were also trained to administer the tests and answer questions of the participants. The scores recorded for each participant were directly used for the analysis.

1. Flamingo Balance Test

Participants balanced on a narrow wooden bar on their preferred leg. The free leg was flexed at the knee. Number of falls in 60 seconds was recorded.

2. Sit & Reach Flexibility Test

Participants were made to sit on the floor with both legs stretched and touching the base of a measuring table with their spine erect. The table had a measuring scale. The initial reading on the measuring scale was taken at the point where the tip of the longest finger touched. They were then asked to stretch fully without bending their legs. The final reading where the tip of the longest finger reached was taken and the distance of stretch calculated by subtracting the initial (non-stretch) reading from the final (full stretch) reading.

3. Sit Ups Trunk Strength

Participants were required to lie on their back with knees bent at right angle to the torso and feet flat on the ground. Their hands were kept behind their head. Participants performed sit ups from this position and returned to initial position. The number of sit ups in 30 seconds was recorded. Incomplete sit ups were not counted.

4. 10x5 meter Shuttle Run Agility Test

Cones were kept at a distance of 10 meters. At the word 'Go', the participants ran to the cone 10 meters away and back five times, without stopping. At the end of the fifth round, the timing was recorded.

Stroop Color-Word Naming Task:

The Stroop color-word task measures the executive function involving word, color and an interference naming response. In effect, the test measures the participant's control over neuropsychological functions involved in color and word naming responses. The reliabilities of the basic scores are high at $W = .88$, $C = .79$, and $C1Y = .71$ (Jensen & Rohwer Jr, 1966). Two Indian studies have found the test suitable for neuropsychiatric evaluation (Pilli, Naidu, Pingali, Shobha and Reddy, 2013; Suresh, Jagadisan, Kandasamy and Senthilkumar, 2018). The scale has been used extensively in Indian studies (Telles, Bhardwaj, Kumar and Balkrishna, 2013; Vanitha, Suresh and Punita, 2017; Prakash et al, 2010). Since the test is reliable, measures an important aspect of cognitive performance and has been used in Indian studies, it was included in this study.

The test consists of three pages. The first page tests how fast the participant can read out words (correct number of words read in 45 seconds). The second page tests how fast the participant can call out the colors (correct number of colors called in 45 seconds). The third page tests the speed with which the participant can name the color of the ink and disregard the word printed in that color ink (correct number of ink colors called in 45 seconds). The test extracts three scores namely, Stroop word score, Stroop color score and Stroop color-word score. These scores were directly used for the analysis.

Rosenberg Self-Esteem Scale:

The Rosenberg self-esteem scale is a self-report scale that measures self-esteem. It is a 10-item scale measuring, both, positive and negative feelings associated with global self-esteem. The instrument uses a 4-point Likert scale. The scale demonstrates a coefficient of reproducibility of .92 and test-retest reliability of .85, which are considered excellent. The scale correlates significantly with other self-esteem measures, thus, demonstrating validity (Rosenberg, 1965). A study with Indian participants found the test reliable with Cronbach alpha coefficient of .81 and Guttman split-half of .73 (Schmitt and Allik, 2005). The scale has been used extensively in Indian studies (Nupur and Mahapatro, 2016; Jhamb, Arun and Garg, 2014; Pal, Sharan and Chadda, 2017; Ramanathan, Bhavanani and Trakroo, 2017; Sethi, Nagendra and Ganpat, 2013). Its high reliability and use in India were the reasons for its inclusion in this study. The 10 item self-reported questionnaire used a 4-point Likert scale. The sum total of scores of the 10 items was used for analysis.

WHO-5 Well-Being Index:

The WHO-5 well-being index is a self-report scale. It has 5 items measuring positive feelings associated with emotional well-being. The instrument uses a 6-point Likert scale. A panel of experts rated this scale as high on clinimetric validity. Content validity studies have found the scale to be unidimensional, with good predictive validity (Topp, Ostergaard, Sondergaard & Bech, 2015). A study with Indian participants showed that the reliability value measured by Kappa statistic is high, at .71 (Barua and Kar, 2010). Many Indian studies have used this scale (Agger, Raghuvanshi, Shabana, Polatin and Laursen, 2009; Firdaus, 2017; Puri, Sapra and Jain, 2013; Chaturvedula and Joseph, 2007). The validity and simplicity of the scale were reasons for inclusion in this study. The sum total of scores of the 5 items was used for analysis.

Sushruta Child Personality Inventory:

The SCPI is a self-report scale measuring personality characteristic. It has 54 items and uses a binomial Yes/No scale. The scale is based on the concept that the mind is always in a dynamic equilibrium between three types of energies called *guna*. The three patterns are *sattvā* (controlled illuminative energy), *rajas* (uncontrolled active energy) and *tamas* (uncontrolled inert energy) (Deshpande, Nagendra and Nagarathna, 2009). Well-being is disturbed when *rajas* and *tamas* become dominant. The scale measures the extent of the three types of energies. The reliability was measured by Cronbach Alpha coefficient and split-half analysis. The scores were over .60, considered as evidence of reliability. Validity was ensured by selecting items which were supported by factor analysis. Patil and Nagendra (2014) have used this scale in an Indian study. The sum total of each section gave a score for the three *gunas*. This was used for analysis.

6.3 RESULTS

6.3.1 RESULTS OF VALIDATION OF ICYM BY SUBJECT MATTER EXPERTS

The ICYM was evaluated by subject matter experts ($N = 21$). The qualification of the experts was Ph.D. (Yoga) 13, MD (Yoga Therapy) 1, M.Sc. (Yoga) 2, Yoga Instructors Certification Course 5. The mean number of years' experience in teaching *yoga* was $M = 19.9$ (8.57) and the range was 4-40. The baseline characteristics of the expert panel are given in Table 4. To test content validity of subject matter expert ratings, Lawshe's Content Validity Ratio analysis was

undertaken. Table 5 gives the results of content validity for the 14 *āsana*s (physical postures) proposed. For a panel size of 21 the CVR_{crit} was calculated at .429. A CVR score $\geq CVR_{crit}$ would constitute sufficient evidence to validate that practice. Conversely, a CVR score $< CVR_{crit}$ would indicate insufficient evidence to validate that practice. Out of the 14 *āsana*s (physical postures), 12 had a CVR score $\geq CVR_{crit}$. Table 6 gives the results of content validity for 7 *prānāyama* practices (breathing exercises). Out of the 7 *prānāyama* practices (breathing exercises), 3 cleared the content validity test with CVR score $\geq CVR_{crit}$. Table 7 gives the results of content validity for 1 *dhyāna* (meditation) and 2 *mantrā* (chanting) practices. 1 *dhyāna* (meditation) and 1 *mantrā* (chanting) practice cleared the content validity test with a CVR score $\geq CVR_{crit}$. The overall module also cleared the content validity test with a CVR score $\geq CVR_{crit}$, indicating the expert opinion that the overall module would achieve its objective (Table 8). Thus, 12 *āsana*s (physical postures), 3 *prānāyama* practices (breathing exercises), 1 *dhyāna* (meditation) practice and 1 *mantrā* (chanting) practice stand validated and can be incorporated in the Integrated Classroom Yoga Module (ICYM).

Table 5: Baseline Characteristics of Subject Matter Experts

N = 21

Qualification	Ph.D. (Yoga)	13 (61.9%)
	M.Sc. (Yoga)	2 (9.5%)
	MD (Yoga)	1 (4.8%)
	Yoga Instructors Certification	5 (23.8%)
Experience	Mean (SD)	19.90
	Range	4-40 years

Table 6: Validated Āsanā (Physical Postures) using Lawshe's CVR

N = 21

Sl. No.	Āsanā (Physical posture)	n_e	N/2	CVR ($n_e - N/2$)/N/2	CVR_{crit}	Select/Reject
1.	Katichakrasana	15	10.5	.810	.429	Select
2.	Tirikaya Tadasana	13	10.5	.429	.429	Select
3.	Ardhakati Chakrasana	17	10.5	.619	.429	Select
4.	Parsvakonnasana	15	10.5	.429	.429	Select
5.	Prasarita Padohasthasana + Ardhachakrasana	14	10.5	.333	.429	Reject

6.	Padahastasana + Ardhachakrasana	16	10.5	.524	.429	Select
7.	Padahastasana + Hastauthanasana	18	10.5	.714	.429	Select
8.	Tadasana	17	10.5	.619	.429	Select
9.	Parivritta Trikonasana	16	10.5	.524	.429	Select
10.	Gaumukhasana	16	10.5	.524	.429	Select
11.	Ardhachandrasana	14	10.5	.333	.429	Reject
12.	Vrkshasana	19	10.5	.810	.429	Select
13.	Garudasana	16	10.5	.524	.429	Select
14.	Veerbhadradasana Pose III	16	10.5	.524	.429	Select

N = Total number of panelists, n_e = Total number of 'essential' (2) rating for each practice, CVR = Content validity ratio, CVR_{crit} = minimum value for acceptance based on binomial probabilities for panel size.

Table 7: Validated Prānāyama Practices (Breathing Exercises) using Lawshe's CVR

N = 21

Sl. No.	Prānāyama (Breathing Exercises)	n_e	N/2	CVR ($n_e - N/2$)/N/2	CVR_{crit}	Select/Reject
1.	Bhastrika	11	10.5	.048	.429	Reject
2.	Ujjai	9	10.5	-.143	.429	Reject
3.	Yogic breathing (abdominal)	18	10.5	.714	.429	Select
4.	Nadi Shudhi	19	10.5	.810	.429	Select
5.	Sheetali	12	10.5	.143	.429	Reject
6.	Sadanta	10	10.5	-.048	.429	Reject
7.	Bhramari	19	10.5	.810	.429	Select

N = Total number of panelists, n_e = Total number of 'essential' (2) rating for each practice, CVR = Content validity ratio, CVR_{crit} = minimum value for acceptance based on binomial probabilities for panel size.

Table 8: Validated Meditation and Chanting Practices using Lawshe's CVR

N = 21

Sl. No.	Dhyāna (Meditation) & Mantrā (Chanting)	n _e	N/2	CVR (n _e -N/2)/N/2	CVR _{crit}	Select/Reject
1.	Mauna	19	10.5	.810	.429	Select
2.	OM mantra	19	10.5	.810	.429	Select
3.	Gayatri mantra	12	10.5	.143	.429	Reject

N = Total number of panelists, n_e = Total number of 'essential' (2) rating for each practice, CVR = Content validity ratio, CVR_{crit} = minimum value for acceptance based on binomial probabilities for panel size.

Table 9: Validation of Overall ICYM Module

N = 21

Sl. No.	Overall Rating of Yoga Module	n _e	N/2	CVR (n _e -N/2)/N/2	CVR _{crit}	Will Yoga Module Achieve Objective
1.	Can achieve objective	16	10.5	.524	.429	Yes

N = Total number of panelists, n_e = Total number of 'essential' (2) rating for each practice, CVR = Content validity ratio CVR_{crit} = minimum value for acceptance based on binomial probabilities for panel size.

6.3.2 RESULTS OF PILOT STUDY TO CONFIRM FEASIBILITY AND EFFICACY OF ICYM

The pilot study was conducted with school children ($N = 49$). The mean age was $M = 13.63$ (1.014). The age range was 12-16 years and gender ratio was $B:G = 23:26$ (Table 10). A paired sample t -test was undertaken to test the hypothesis that *yoga* intervention with ICYM module will result in a statistically significant different post-intervention means compared to pre-intervention means for physical fitness, cognitive performance and emotional well-being variables. The paired sample t -test was associated with statistically significant effect in the following variables (Table 11):

EUROFIT Fitness Testing Battery:

The paired sample *t*-test was associated with statistically significant differences in post-intervention means compared to pre-intervention means with small to medium effect sizes in all four tests namely, balance, flexibility, strength and agility.

Flamingo Balance Test: $t(48) = 3.03, p = .004, \text{Cohen's } d = .43$

Sit & Reach Flexibility Test: $t(48) = 2.52, p = .015, \text{Cohen's } d = .36$

Sit Ups Trunk Strength Test: $t(48) = 2.55, p = .014, \text{Cohen's } d = .36$

10x5 meters Shuttle Run Agility Test: $t(48) = 2.61, p = .012, \text{Cohen's } d = .37$

Stroop Color-Word Task:

The paired sample *t*-test was associated with statistically significant differences in post-intervention means compared to pre-intervention means with medium to large effect sizes in all three scores namely, word, color and color-word.

Word Score: $t(48) = 5.41, p = .001, \text{Cohen's } d = .77$

Color Score: $t(48) = 4.24, p = .001, \text{Cohen's } d = .61$

Color-Word Score: $t(48) = 4.39, p = .001, \text{Cohen's } d = .63$

Rosenberg Self-Esteem Scale:

The paired sample *t*-test was associated with statistically significant difference in post-intervention mean compared to pre-intervention mean with small effect size.

$t(48) = 2.75, p = .008, \text{Cohen's } d = .39$

WHO-5 Well-Being Index:

The paired sample *t*-test was associated with statistically insignificant difference in post-intervention mean compared to pre-intervention mean.

$t(48) = 0.63, p = .532, \text{Cohen's } d = .09$

Sushruta Child Personality Inventory:

The paired sample *t*-test was associated with statistically insignificant difference in post-intervention means compared to pre-intervention means in all three scores namely, *sattva*, *rajas* and *tamas*.

Sattvā Score: $t(48) = 0.07, p = .947.$, Cohen's $d = .01$

Rajas Score: $t(48) = 1.92, p = .061,$ Cohen's $d = .27$

Tamas Score: $t(48) = 1.88, p = .067,$ Cohen's $d = .27$

The intervention with the school-based short duration ICYM gave a statistically significant difference in means of physical fitness, cognitive performance and self-esteem variables. The effect sizes ranged from small to medium in physical fitness measures, medium to large in the cognitive performance measure and small in the measure of self-esteem. The difference in means of emotional well-being and personality characteristic variables were insignificant. It can be concluded that ICYM is efficacious in improving physical fitness, cognitive performance and self-esteem.

Table 10: Age and Gender of Pilot Study Sample

N = 49

Age in years	13.63 (1.014)
Age range	12-16
Gender ratio (B:G)	23:26

Age is Group Mean (SD).

Table 11: Variables of Scales Tested: Paired Sample *t*-test

	N = 49				
	Pre	Post	<i>T</i>	<i>p</i>	Cohen's <i>d</i>
EUROFIT Fitness Testing Battery					
Flamingo Balance Test	7.37 (6.366)	5.12 (5.270)	3.03	.004	.43
Sit & Reach Flexibility Test	13.08 (4.983)	14.94 (6.105)	2.52	.015	.36
Sit Ups Trunk Strength Test	19.18 (4.777)	21.12 (5.540)	2.55	.014	.36
10x5 meters Shuttle Run Agility Test	15.79 (1.964)	16.33 (1.527)	2.61	.012	.37
Stroop Color-Word Task					
Word Score	92.92 (13.156)	98.59 (13.233)	5.41	.001	.77
Color Score	58.53 (11.616)	65.82 (9.901)	4.24	.001	.61
Color-Word Score	32.14 (10.454)	37.51 (9.520)	4.39	.001	.63
Rosenberg Self-Esteem Scale	27.78 (3,454)	29.10 (3,435)	2.75	.008	.39
WHO-5 Well-Being Index	16.59 (4.286)	17.00 (3.953)	0.63	.532	.09
Sushruta Child Personality Inventory					
	13.63 (2.118)	13.65 (1.877)	0.07	.947	.01
<i>Sattvā</i> Score	8.82 (2.297)	8.29 (2.000)	1.92	.061	.27
<i>Rajas</i> Score	6.94 (2.025)	6.35 (1.964)	1.88	.067	.27
<i>Tamas</i> Score					

Pre and Post are Group Means (SD).

6.4 DISCUSSION

The aim of the study was to develop a validated short duration ICYM for benefiting school children in physical fitness, cognitive performance, self-esteem, emotional well-being and personality characteristic measures. The present study found that the module was well accepted by both teachers and students. No problem was encountered in practicing the module in the classroom environment. The paired sample *t*-test showed that the differences in post-intervention means compared to pre-intervention means were significant for physical fitness, cognitive performance and self-esteem variables but insignificant for emotional well-being and personality characteristic variables. It can be concluded that ICYM had a statistically significant impact on physical fitness, cognitive performance and self-esteem measures of school children.

6.5 STRENGTHS OF THE STUDY

The strengths of the study were: (i) Methodical development of the *yoga* intervention module, based on ancient and contemporary literature, aimed at benefiting physical, mental, emotional and personality domains of school children. (ii) Validation by subject matter experts using a recognized statistical analysis tool. (iii) Validation followed up with an uncontrolled pre-post pilot study design that confirmed the module's feasibility and efficacy regarding physical

fitness, cognitive performance and self-esteem measures. (iv) As a result, the study presents a validated and efficacious short duration classroom *yoga* module.

6.6 LIMITATIONS OF THE STUDY

The limitations of the study were: (i) The period of the intervention of one month was short. (ii) Since this was a pilot study, there was no Control group. It is suggested that a randomized control trial be undertaken with a longer period of intervention and larger sample size to prove the module's efficacy on physical fitness, cognitive performance, self-esteem, emotional well-being and personality characteristic of school children.

To me the very essence of education is concentration of mind, not the collection of facts. If I had to do my education over again and had a voice in the matter, I would not study facts at all. I would develop the power of concentration and detachment, and then with a perfect instrument I could collect facts at will. Side by side, in a child, should be developed the power of concentration and detachment.

Swami Vivekananda