SYMPHONY: Towards Uplifting Well Behavioural Attitudes

V. Mohanadarshan, S. I. Praveen, M. M. S. Ahamed, M. S. M. Zayan, P. S. Haddela and P. Fernando

Abstract— Presence of good behavioural and positive attitudes is extremely important in human beings to lead a respected life. This paper gives detailed description about using IT based solution for attitude development in children. The main goal of this tool is to encourage healthy attitude development of a child and to motivate good attitude based knowledge improvement through interactive learning environments. The tool is developed based on affective domain of Bloom’s Taxonomy. It will deliver attitude development to children effectively, efficiently and interactively.

Keywords- Bloom’s Taxonomy, Attitude Development, Affective Domain, Children Games, Role Playing

I. INTRODUCTION

Modern world’s educational learning is predominantly based on its earning capabilities; the age of behavioural and positive attitude learning is slowly and simply slipping away from today’s youngsters specially children. This issue has extremely dented the behaviour of these children when they grow up, inappropriately behaving in places where appropriate behaviour is demanded. Take everyday situations where everyone observes it daily in news segments, student union protests which are meant to be peaceful rallies, ending in violent protests [1], parliamentarians, the so called people’s representatives who must serve as beacons of good will and educated behaviour fight inside the parliament with other members as violent persons and use inappropriate low levels of language [2], etc. These events occurred in the first place due to attitude emptiness in academic staff. In observing these incidents everyone has to wonder that something is missing which is important, what is it? The answer to that being discipline. How can these people be disciplined? Well that leads to all elusive but crystal clear answer that is attitude development.

Attitude, the word means “A settled way of thinking or feeling, typically reflected in a person's behaviour.” [3], in simplified terms the way a person is thinking as that is expressed through their actions. From the definition we can grasp the fact that is; attitude depends on the environment as well as the individual person’s choice or opinion in reacting to that environment which surrounds them. In simpler terms this indicates that even if the surrounding environment influences a lot in a person’s behavioural and positive attitude development; that person’s personal choices affect in their attitude development too. Why attitude development in children? Why not in adults? From the scenarios that previously given in this paper points out to misbehaviour in adults not children, but to change an adult’s behavioural positive attitude which is set and defined throughout their entire lifetime takes time, physical counselling, physical interaction and environment changes which is hard to provide and emulate through an IT based solution. To counter this problem the authors targeted the younger audience specially the children who are yet to mould their minds into accumulating the behaviours and attitudes that will define their characters as they age. This is the basis that authors have prepared the SYMPHONY to reach each and every child in a personal level and appeal to them to change their ways to socially approved attitudes.

Simply we can say SYMPHONY is software, which can be used in the classroom environment, which will help to identify different levels of behavioural attitude of children and helps to develop them for brighter future. Throughout this paper the authors try to demonstrate the feasibility, effectiveness, efficiency and the practicality of an IT based solution used to develop a knowledge based physiological component involved with a person’s individual preference and emotions of that which relate to attitudes.

II. BACKGROUND AND RELATED WORKS

When consider the present environment, the teaching and learning process has been mostly teacher related and more towards knowledge development of children, particularly force feeding large amounts of memorisable content, far less importance was given to behavioural attitude development and some form of importance was given to practical skills development. When the authors map this educational background into all of accepted frameworks like Bloom’s, Webb’s, and Solo etc. there is a significant gap which indicates the lack of attitude development. This is the background issue in which the authors have analysed to develop the system.

A. Related Frameworks

After conducting a full scale background analysis of attitude development, the authors have picked that it was obvious that there were a lot of frameworks that can be used as a base for the IT solution. Main four frameworks can be identified and separated from others due to their
universal acceptance and similarity between each other, which includes the Bloom’s Taxonomy [4], Webb’s Depth of Knowledge [5], Marzano’s Dimensions of Learning [6] and Briggs’ Solo Taxonomy [7]. After further analysis we have chosen the Bloom’s Taxonomy as the system’s basic framework on which the development has been carried out. The reasons for choosing this taxonomy and comparisons with the previously mentioned educational methodologies are indicated below.

1) Webb’s Depth of Knowledge: This model also called as the Depth of Knowledge or DOK was developed by Norman Webb a Wisconsin research scientist and mathematics educator. Webb’s four levels of depth-of-knowledge are level 1 (recall), level 2 (skill/concept), level 3 (strategic thinking), and level 4 (extended thinking), and they are applicable to all subject areas and at all grade levels, including college [5]. These four levels are not further divided into more levels or categories. Webb's Depth of Knowledge and Bloom's Taxonomy are tools for understanding and evaluating learning levels. Instructors can gauge the extent of subject mastery based on discrete steps as described in either tool. Webb uses four levels within his evaluation profile compared to Bloom’s six stages. Recognizing DOK levels is not always clear-cut or simple. While some assignments, activities, and/or questions are easily identifiable as a certain DOK level, others are not. Furthermore as in Webb’s DOK there are no clear cut elements for attitude development. Even though all components of Knowledge and skill are in cooperation they still seem not clear cut nor easy to define and attitude development steps clearly mentioned in Bloom’s Taxonomy are clearly left out.

2) Biggs’s Solo Taxonomy: This model was designed by Briggs and Collis in 1982. ‘Structure of the Observed Learning Outcome, a means of classifying learning outcomes in terms of their complexity, enabling us to assess students’ work in terms of its quality not of how many bits of this and of that they got right [7]. Biggs’ Solo (Structure of the Observed Learning Outcome) Taxonomy is a systematic way of describing how a learner’s performance develops from simple to complex levels in their learning. There are 5 stages, namely Pre-structural, Uni-structural, and Multi-structural which are in a quantitative phrase and Relational and Extended Abstract which are in a qualitative phrase. Bloom’s Taxonomy is a systematic way of describing how a learner’s performance develops from simple to complex levels in their affective, psychomotor and cognitive domain of learning. Again there is lack of focus on attitude development rather than the structure is purely based on knowledge and skills development this educational methodology will not suit the authors intended research path.

3) Marzano’s Dimensions of Learning: This educational methodology has five independent dimensions which doesn’t depend on each other but act as very important necessary components. Those five dimensions are, Positive Attitudes and Perceptions about Learning, Acquisition and Integration of Knowledge, Extension and Refinement of Knowledge, Meaningful Use of Knowledge and Productive Habits of Mind [6]. Marzano’s categories of how people think are different from Bloom’s in that the categories do not build upon each other. Each cognitive category is just as important as the others. The Dimensions of Learning represent elements that Marzano believes are all worthy of focus and inclusion within a unit of study. Even though there is dimension that focuses on attitudes that attitude is based upon the knowledge sector of the attitude domain focusing mainly on class room environment and its relational acceptance. What the authors of this paper expected was to focus on all aspects of attitude especially the behavioural aspects and positive aspects of life related attitudes.

4) Bloom’s Taxonomy: Bloom’s Taxonomy, (in full: ‘Bloom’s Taxonomy of Learning Domains’) was initially published in 1956 under the leadership of American academic and educational expert Dr Benjamin S Bloom [4], [8]. Bloom's Taxonomy has since been expanded over many years by Bloom and other contributors. Bloom’s taxonomy has three upper level domains of cognitive/knowledge domain, affective/attitude domain and psychomotor/skills domain. These upper level domains are further divided into sub levels which depend upon each other to deliver a complete educational plus psychological perspective to a particular learner. The authors have predominantly selected this educational methodology to aid and to base in the development of the solution to preach good behavioural attitudes to children for the simple fact that it has clearly defined borders of knowledge, attitude and skills where the authors can base the development on affective domain and its five sub levels.

B. Related Systems

We have done a deep background study to find out the details about the research area of attitude development that the authors are going to focus. Unfortunately there are no educational tools for children, based on affective domain of the bloom’s taxonomy or any other frameworks that focuses on attitude in equivalence to knowledge and skills. The authors have gone through many of the currently existing self-learning tools and have selected a few tools which are considered to be of high standard in the current existing environment and are listed below. These tools are mostly based upon games which reasons out properly due to the fact that our target base market is identified as children [9], [10], [11]. Games naturally appeal more to children than the tough interfaced applications. Most of the applications that were reviewed by the authors can be divided into three simple categories.

1) Online games plus applications with ever changing innovative content.

2) Traditional questionaries that includes MCQs, lengthy questions, short questions, comprehensions and listening passages etc.
3) Stand-alone applications plus games with fixed content and scope.

These systems supported by Bloom’s Taxonomy and a very good modern syllabus, provides an excellent platform for children to develop their knowledge foundries efficiently, effectively and most importantly interactively. The traditional questionnaire applications have no innovative content but they have a strong backbone of content that can’t be disputed by other categories, here the stand alone applications plus games have been let down due to the fact that they have a certain amount of fixed content but that content is not as deep as traditional questionnaire applications.

C. Comparison with Related System to Authors’

The authors have gone through many learning applications for kids and found out many similarities and differences between those applications. Most of the applications just provide knowledge in various areas but does not concern in analysing the mental or behavioural development. The lessons that are provided by the applications are isolated from one to another, there is no any relationship between the applications and child also needs to follow their lessons only even though they like it or not. This kind of learning strategies cannot help for development rather discourages the knowledge exploration. The lacking factor in [7],[12],[13],[14],[15] all these learning tools are that, they only focus on the Cognitive or Knowledge domain of Bloom’s Taxonomy and Psychomotor or Skills Domains where the other important sector of Bloom’s Taxonomy of, that is Affective or Attitude Domain is completely and utterly ignored. The existing tools developed in relation to Bloom’s Taxonomy are only focused on developing a child’s education not his behavioural attitude or how well that child will apply that theoretical knowledge into practical, both of these factors are extremely important in moulding that child into a suitable well-mannered person that the future society will accept and respect. Here is our learning tool SYMPHONY is set aside by not only focusing on the cognitive domain but also in affective domain as well.

While the existing tools only focus on the children schooling curriculum and stick with that, restricting the child’s character development into tight confided place where our tool focus on giving the child an unrestricted open world interactive environment scenario to learn not only knowledge but also behavioural attitude with a hint of direction and guidance to keep the child in check in-order to go in the correct intended development path even without the child realizes it. Along with the game scenario a background grading system will inform the Teacher of their students’ progress with the development advices and guidance tips.

III. AFFECTIVE DOMAIN

Bloom’s Taxonomy underpins the classical ‘Knowledge, Attitude, Skills’ structure of learning method and evaluation, Bloom’s Taxonomy of Learning Domains remains the most widely used system of its kind in education particularly, and also educational industry and training [16]. It’s easy to see why, because it is such a simple, clear and effective model, both for explanation and application of learning objectives, teaching and training methods, and measurement of learning outcomes. Bloom’s Taxonomy provides an excellent structure for planning, designing, assessing and evaluating training and learning effectiveness. The model also serves as a sort of checklist, by which you can ensure that training is planned to deliver all the necessary development for students, trainees or learners, and a template by which you can assess the validity and coverage of any existing training, be it a course, a curriculum, or an entire training and development programme for a large organisation [4], [8], [17].

Domains can be thought of as categories. Trainers often refer to these three categories as KSA; Knowledge - Cognitive domain (intellectual capability or ‘think’), Attitude - Affective domain (feelings, emotions and behaviour or ‘feel’) and Skills - Psychomotor domain (manual and physical skills or ‘do’). This taxonomy of learning behaviours can be thought of as “the goals of the learning process.” That is, after a learning episode, the learner should have acquired new skills, knowledge, and/or attitudes [18], [19].

Bloom’s Taxonomy second domain, the Affective Domain, was detailed by this structure and sequence for developing attitude also now commonly expressed in the modern field of personal development as ‘beliefs’. Again, as with the other domains, the Affective Domain detail provides a framework for teaching, training, assessing and evaluating the effectiveness of training and lesson design and delivery, and also the retention by and affect upon the learner or trainee. Affective Domain Components are:

1) Receive: refers to the student’s willingness to attend to particular phenomena of stimuli (classroom activities, textbook, music, etc.). Learning outcomes in this area range from the simple awareness that a thing exists to selective attention on the part of the learner. Receiving represents the lowest level of learning outcomes in the affective domain.

2) Responding: Active participation on the part of the learners, Attends and reacts to a particular phenomenon. Learning outcomes may emphasize compliance in responding, willingness to respond, or satisfaction in responding (motivation).

3) Valuing: The worth or value a person attaches to a particular object, phenomenon, or behaviours. This ranges from simple acceptance to the more complex state of commitment. Valuing is based on the internalization of a set of specified values, while clues to these values are expressed in the learner’s overt behaviours and are often identifiable.

4) Organization: Organizes values into priorities by contrasting different values, resolving conflicts between them, and creating a unique value system. The emphasis is on comparing, relating, and synthesizing values.
5) Internalizing values (characterization): Has a value system that controls their behaviours. The behaviour is pervasive, consistent, predictable, and most importantly, characteristic of the learner.

Authors are developing the software components based upon these five sub levels. These levels are not independent of each other a signature trade mark of all Bloom’s taxonomy domains. Each sub level is greatly dependent on each other as the audience must flow through each and every component to be able to feel the full changes. As children are the intended audience of the authors they will move on from receiving the behavioural attitude material to responding to the materials previously forwarded to valuing those materials by personal grading to organizing and internalizing those materials will be the target of authors.

IV. SOFTWARE DEVELOPMENT

![Diagram](image)

The above figure 1 indicates the conceptual diagram in relation to bloom’s taxonomy’s affective domain.

A. Flow of SYMPHONY

Initially the teacher has to create separate profiles for each child and has to give authorization to use the system. Afterwards the child will be given a gaming kind of interface to continue his journey deep down. The child will not know the background scoring and evaluation criteria behind the scene, because the scoring is meant to be transparent to the child’s perspective. After each level completion the child will be redirected to the main window, so that they can choose a level which is active and move forward through the gameplay. Along the game flow, child will be given many interesting mini-games which will act as a complement for game flow modules.

On each level the child will be given decisional points, where the child would choose the best option that he/she thinks which is appropriate for the situation. On each level the child has to grab the situation and respond accordingly. For each unsuccessful selection of options will lead to reduction of score. SYMPHONY provides interactivity to the child to try out a virtual scenario with full of options and decision making, so that the child would learn the separation of good and bad and other valuable things by completing the levels. The choices that the child makes are recorded in the database for scoring and evaluation purposes. The decision making is the main back bone of this game play. The system has been developed into three major areas that includes a role playing game, attitude based knowledge applications and a reporting system.

B. Role Playing Game

Firstly the role playing game consists of an open world environment which is similar to the day to day environment that the child is engaging in real life. This game will help the child to prepare for the worldly challenges which they are face in their normal routine life as will also let the child choose what actions to take without guidance or interference of grown-ups. This way the child learns to make decisions on their own and as well as the game depicts the choices they make into different and various responses, the children will realise the effect of making correct action according to a certain situation. The game contains a fairly simple game play mechanism; understandable to children’s logic level, furthermore it contains fewer navigation control sets, which enable the child to easily navigate through the game. The game further divided into separate scenarios assigned in alignment with affective domain’s sub levels; the game consists of four scenarios namely Home, School, On Road and Playground.

C. Attitude Knowledge Based Application

The attitude knowledge based application which is based on educating the child’s attitude related knowledge areas about how to greet others, how to behave in certain situations, how to eat properly, the cleanliness habits to maintain and simple attitude related guidance. These applications are designed with far less complexity to be easily grasped by the child; also it has very few control functions to interact with the child, so the child can remember them easily. These applications contain a very bright and colourful interface in which the children can be attracted to and stay connected for hours and hours without getting bored.

The application on the other hand contains three major components; that of attitude orientation, attitude knowledge development and attitude knowledge retaining. The first sector of attitude orientation helps the system to create a current profile of a child’s attitude and enables the system to determine in which zone of attitude the child belongs to. As the authors are dealing with behavioural attitudes there are three zones in which ones attitude can be atoned to; those are negative, positive and neutral attitude zones. This sector contains a series of MCQ questionaries and reflects action image choosers for child to attend; that enables the system to create that child’s profile and assign it to a particular zone. The second sector of attitude knowledge development allows the child to grasp the knowledge components of behavioural attitudes. As many children are not properly educated regarding how to act in most situations like...
helping others, sharing, giving and politeness. This sector educates about proper behaviour in these situations via indirect advising through various MCQs, image interactions, comprehension passages and interactive story telling etc. The third sector of attitude knowledge retaining, analyses how much of the knowledge given to the child has been actually grasped by the child. This sector contains a series of practical scenarios and real life situations stimulations where the child need to respond with proper behavioural attitude. This will determine the level of change in a child’s behaviour after exposure to the system. This component will come at the end of the system, after the game completion the child attends this sector to ensure their attitude development progress.

D. Reporting

The reporting component is the anchor that grades the child according to their performance in both attitude based games and applications. Unlike other related components reporting component is not directly visible to the child as they must feel comfortable with the system. Reporting component is a background process where points will be given by getting the responses of the child, by throwing some decision points such as how the child reacts in certain situations and how they respond to some situations inside the game as well as applications. These grading points will be compared from the data that are collected from several other active SYMPHONY systems; then it will be compared graphically and inform to their teacher about the progress comparing with average performances by other children.

The grading segment of the system acts as the evaluation segment of the entire system. The total system will be interconnected through the grading segment. Each and every action that a child makes within the game scenarios or the applications segments will be recorded inside the grading database and will be given the appropriate points level predetermined by the authors. After a scenario or a component is finished within the system the points will be recorded. Grading segment is interconnected with the teacher’s system and all points will be recorded in centralised database. This will allow for aggregation of children’s performance and the analysis and comparison of a particular child’s performance to the aggregate level. The child’s initial attitude profile will be also stored and it will be compared to the changes in that profile as the child participates in the system in a given time. The reports that are generated by the system contains the current attitude profile of a child and the comparison of that profile to that of an aggregate profile in that age criteria.

V. MAPPING AFFECTIVE DOMAIN TO SOFTWARE IMPLEMENTATION

The following relates to the game component of the author’s SYMPHONY system. The game is separated into four scenarios as previously mentioned; the authors have designed the game based on the affective domain’s sub levels accordingly. The first scenario that is Home Environment; is further separated into Bed Room, Bath Room, Study Room, Living Room, Kitchen and Front Yard. We have taken the first two steps of the sub levels receive and respond by giving the guidance to the child and monitoring their response. We have devised simple works shifts where the child will clean their rooms, washing their hands before eating, brushing teeth before drinking or eating, being responsible towards saving the water and electricity, habit of choosing the healthy food, greeting parents in a nice manner, organizing their books according to schedule, wearing the uniform on their own and talking to parent with proper respect. The attitude domain’s sub level, receiving refers to the student’s willingness to attend to particular phenomena or stimuli (classroom activities, textbook, music and etc.). [11] From a teaching standpoint, it is concerned with getting, holding, and directing the student’s attention. Learning outcomes in this area range from the simple awareness that a thing exists to selective attention on the part of the learner. Receiving represents the lowest level of learning outcomes in the affective domain.

The receiving is also tutored to the children by the applications designed to project attitude knowledge based information. Responding refers to active participation from the student’s side. At this level the child not only attends to a particular phenomenon but also reacts to it in some way. Learning outcomes in this area may emphasize acquiescence in responding (reads beyond assignments) or satisfaction in responding (reads for pleasure or enjoyment). The higher levels of this category include those instructional objectives that are commonly classified under interest; that stresses the seeking out and enjoyment of particular activities. The second scenario which is On Road is in cooperated with both responding and valuing. This scenario has small work shifts like helping others, giving respect to the elderly, cleaning the environment and preventing any disturbances to be caused to others. Valuing refers to concerned with the worth or value a student attaches to a particular object, phenomenon, or behaviour. This ranges in degree from the simpler acceptance of a value (desires to improve group skills) to the more complex level of commitment (assumes responsibility for the effective functioning of the group). Valuing is based on the internalization of a set of specified values, but clues to these values are expressed in the student’s overt behaviour that is consistent and stable enough to make the value clearly identifiable. Instructional objectives that are commonly classified under attitudes and appreciation would fall into this category [4].

The third and fourth scenarios which are School and Playground correspond to organization and internalizing values. Organization refers to concerned with bringing together values, resolving conflicts between them, and beginning the building of an internally consistent value system. Thus emphasis is on comparing, relating, and synthesizing values. Learning outcomes may be concerned with the conceptualization of a value (recognizes the responsibility of each individual for improving human relations) or with the organization of a
value system (develops a vocational plan that satisfies his need for both economic security and social service). Instructional objectives relating to the development of a philosophy of life would fall into this category. The individual child has a value system that has controlled his behaviour for a sufficiently long time for him to develop a characteristic life style [20]. Thus the behaviour is pervasive, consistent, and predictable. Learning outcomes at this level cover a broad range of activities, but the major emphasis is on the fact that the behaviour is typical or characteristic of the child. Instructional objectives that are concerned with the student’s general patterns of adjustment (personal, social, emotional) would be appropriate here. The school and playground has the same work shift as the same as home and on road scenarios.

VI. CONCLUSION AND FUTURE WORK

SYMPHONY will be a complete learning tool for children that completely covering all aspects of affective domain of Bloom’s Taxonomy. This tool will be a better solution than the currently existing education tools as it not only gives a knowledge based attitude improvement for their appropriate age but trains the children to get used to healthy attitude habits by guiding them and also combining these two factors to provide grading schemes in relation to the improvements of their skill levels. Due to the unique inactive involvement of this tool, specially designed colourful attractive interfaces and computer graphics makes this tool a very child friendly tool thus resulting easy reaches to the targeted audience. Furthermore in-order to make this tool far more interesting we have included a variety of interesting games which are also enhance the child’s education and also will make the child to willingly spend time with this tool rather than forcing them to do so.

This tool will be a model and also help teachers to develop good behavioural attitudes in children from an early stage insuring that they will not be turned into mindless beasts without rational thinking but will help to create a peaceful and understanding society. We are sure that SYMPHONY is going to be a new era in the field of attitude development for children. The first trial evaluation is already published and is available on the following link: http://www.sevendreamz.com/btdad

REFERENCES


