

Educational Toy Set

The present invention relates to an educational toy set and a method for generating an auditive output in particular by an educational toy set, all according to the preambles of the independent claims.

5 Technological Background

As of lately and with the rise of touchscreen enabled tablet computers, the run of educational and instructive toys has adapted computing as one of the main tools of incorporating learning stimulation. Even though that might be a good choice for teaching and exposing children to the way computers work and maybe even symbolic thinking, it
10 has long been an accepted truth in pedagogic theory that the best approach to learning is one that stimulates all the available senses. Tablet computers and computers in general are mostly only usable for stimulating the visual sense and the hearing. Likewise, building blocks and manipulatives that have been used since ages as instructive toys for children are highly valued, as they stimulate the sense of touch in addition to the visual
15 sense, still, they lack stimulation in the auditive field and do lack in providing an interactive learning experience.

There is therefore a need in educational and instructive toys that enable tactile and perceptual learning, are ready-to-hand material, and can be used for learning a wide variety of subjects, for instance also be used for supporting mathematical understanding
20 and usable in logopaedics.

WO 2015/073530 A1 discloses a toy that assembles a story which can be played for the user according to a set of blocks that are arranged in a certain order. The order determines which of the themes, such as subjects, characters, plots, roles or other story attributes or elements are played in which order. The device still mostly relies on a virtual
25 stimulation by providing a screen where the story unfolds according to a series of blocks that are arranged by the user and then played as a story composed of definite story blocks on the screen. Although that provides for a large combination of stories possible out of a certain set of blocks and certainly invites experimentation and may be even

stimulates narrative thinking and story building, the educational toy in itself provides little in the field of enabling getting a «grasp» in the form of tactile stimulation while apprehending and engaging with complex and abstract subjects such as mathematics and language.

5 **Summary of the Invention**

It is therefore an object of the present invention to provide an educational toy that overcomes at least one problem of the prior art. It is a particular object of the present invention, to provide an educational toy that is easy to use and safe for children aged between one and sixteen, and that provides a learning stimulation in the visual, auditive
10 and tactile field. One further particular object of the present invention is the providing of an educational toy set that provides an interactive experience and at the same time reduces screen time of children.

One particular object of the present invention is concerned with providing an educational toy and a method for giving an auditive output in an educational toy set that is reflective
15 of the intended learning experience and/or a handling of at least parts of said toy set.

At least one of these objects is solved by the features in the characterizing portion of the independent claims.

One aspect of the present invention is an educational toy set. The toy set comprises a shape having at least one shape-identifier corresponding to one or more shape
20 feature(s).

The educational toy set further comprises a shape-identification element having at least one reader to detect and/or activate at least one shape-identifier inside an effective range of the at least one reader.

The educational toy set further comprises a processing unit, that is adapted at processing
25 a detecting and/or activating of at least one shape-identifier by the reader.

It further comprises an output unit, that is adapted at giving an auditive output. The output is reflective of the processing of that detecting and/or activating and in conjunction with the one or more shape feature(s).

In the context of the present invention, a «set» can be understood for instance as a plurality of items that functionally belong together. In this context, a set can be understood as a plurality of items that mate with each other.

Further in the context of the present invention, a «shape» can be understood as an item defined by its external boundary such that it represents a particular geometric form.

In a preferred embodiment of the present invention, the shape is a building block, particularly preferred the building block is an essentially symmetrical three-dimensional shape which is contained by six equal squares, i.e. the shape is a cube.

In a particular embodiment of the present invention, the shape feature(s) comprise(s) an information regarding a particular characteristic of the shape in question. This can for instance be information regarding a particular geometric form of the shape. Alternatively, or in addition to that, the shape feature(s) can comprise information regarding any one of the following or a combination of: color of the shape, surface property of the shape, image and/or letter(s), word(s), sentence(s), number(s) represented on any one of the surfaces of the shape.

In a particularly preferred embodiment, the shape feature(s) corresponds to an operator that is represented on at least one surface of the shape.

In the context of the present invention, an operator is to be understood in the mathematical sense, in that it stands for a mathematical operation. Most commonly used mathematical operation symbols are: +, -, =, :, x. These operations symbolize addition, subtraction, equals to, divided by, multiplied by, respectively.

The educational toy set of the present invention provides a toy set that can be used to stimulate learning of a wide variety of subjects. The subjects can be implemented by providing the respective shape feature(s) on the shape(s), which can be made to interact with each other by means of the processing unit recognizing the shapes, putting a succession of the shape(s) into a logical order and providing a sensible output for the

output unit reflective thereof. The educational toy set can enhance the learning stimulation from the use of the shape feature(s), which by themselves can be designed to be attractive for children to interact with and stimulates the auditive, visual and tactile senses of the user. The stimulation of the somatosensory system by means of the haptic
5 handling of the shape(s) is particularly advantageous for the learning experience associated with the educational toy set.

In a particular embodiment of the present invention, the toy set comprises a plurality of shapes, each having at least one shape-identifier corresponding to one or more shape feature(s).

10 In a particularly preferred embodiment of the present invention, the plurality of shapes is a number of shapes between one and twenty-five shapes, in particular between one and fifteen shapes, even more in particular between three and ten shapes.

In a particular embodiment of the present invention, the toy set comprises a plurality of shape-identification elements. Each shape-identification element has at least one reader
15 and each has at least one effective range of said at least one reader.

In the context of the present invention the effective range can be understood as a zone in which a contact-free detection can happen between a reader and a shape-identifier of a particular shape. The effective range can extend in an angle from the shape-identification element, such that a plurality of effective ranges that are arranged next to
20 each other do not overlap. With this configuration, the educational toy set is capable of identifying in which position in a plurality of shape-identification elements positions' a particular shape with a particular shape-identifier is placed. This provides the educational toy set with the possibility to enact operators on a number of shapes that have shape feature(s) corresponding to numbers, for instance. In an effective use that would mean
25 that if a sequence of three shapes is placed where the first shape has the shape feature corresponding to a number, for instance one, the second shape has a shape feature corresponding to an operator, for instance plus, i.e. an addition, and the third shape has the shape feature of a number, for instance two, then the effective ranges of three shape-identification elements on the educational toy set would be arranged, so as to not
30 overlap, so that each of the shape-identification elements is capable of unequivocally identifying the particular shape feature(s) of the shape that they interact with in a manner, so that the educational toy set is capable of providing an auditive output corresponding

to the result of the respective mathematical operation, i.e. in the particular example the auditive output would loudly state «three».

In a particular embodiment of the present invention, the detecting and/or activating is performed when one shape-identifier is inside an effective range of at least one reader.

- 5 Alternatively, or in addition certain shape-identifiers can be arranged, such as to activate and/or detect a shape-identifier only when two effective ranges overlap. This particular embodiment makes it possible for instance for detecting stacked shapes.

In a particular embodiment, the shape-identifier is adapted to be activated and/or detected by means of an electromagnetic field.

- 10 In a particularly preferred embodiment, the shape-identifier is a passive radiofrequency tag. Alternatively, the shape-identifier is an actively sending tag.

- In a particularly preferred embodiment, the shape-identifier and the reader use near field communication as communication protocol. In this embodiment, the effective range essentially corresponds to a radiofrequency field and the detecting and/or activating
15 comprises a powering of a passive tag in the form of the shape-identifier.

In a particular embodiment, the shape-identifier comprises a unique identification code that enables a shape identification element to unambiguously identify the shape a particular shape-identifier is associated with. In a particular example, the unique identification code is a serial number.

- 20 In a particularly preferred embodiment of the present invention, the educational toy set is provided with one or more shields that shape the effective range of the at least one reader, such as to enable a detection of a shape-identifier clearly and unambiguously. Suitable shields for shaping the effective range can be made of typical radiofrequency blocking materials, such as for instance aluminum layers and/or other metal layers
25 blocking radiofrequency electromagnetic waves from extending in a particular angle from the reader. In a particularly preferred embodiment, the one or more shield is/are arranged inside a play tray with a plurality of shape identification elements, so that readers, each associated with one shape identification element, have shaped effective ranges that do not overlap with each other or do overlap is controlled zones with each other, only.

In a particularly preferred embodiment, the shape-identification element having at least one reader is arranged in a play tray. Preferably the play tray comes with a plurality of depressions each capable of receiving a shape and mating with the respective shape. The depression can be integrated in the tray in a manner, that shield material for the reader can be arranged such as to shape the effective range.

In a further alternative or additional embodiment, the processing unit is adapted at performing a reading by means of the reader in certain time intervals and to react with subsequent readings according to a first detection. For instance, the reader can be a first antenna that is suitable at detecting a shape-identifier at a first effective range of between 0.1 and 5 cm, and upon detection engage a second antenna that is adapted at detecting a shape-identifier in the range of between 0.1 and 10 cm. With such an arrangement it would be possible, for instance, to detect stacked shapes on one shape-identification element.

In a particular embodiment of the present invention, the output is reflective of a feature of a specific one of a plurality of shape-identification element(s) that has performed the detecting and/or activating of the at least one shape-identifier. For this embodiment, each shape-identification element can be attributed with a particular feature. This feature can correspond for instance to a position of the shape-identification element in the arrangement of the educational toy set, for instance the position on a tray. In the particular example, where the educational toy set comprises a tray on which the shape-identification elements are arranged this feature can for instance be the location of the shape-identification element on the tray. Sample locations can be for instance: the first shape-identification element from an end of the tray and respectively a corresponding number that is reflective of the position count of the shape-identification element.

In an alternative and/or additionally embodiment, the feature can also be reflective of a particular characteristic of the shape-identification element. This characteristic can for instance be the geometry of the shape-identification element, when it is suited to mate with a particular shape, for instance. In this example a shape-identification element can be essentially quadratic in shape, such as to mate with a shape in the form of a cube. Of course, the skilled artisan perfectly understands, that any combination of shape-identification elements geometry and shape(s) can be realized in the context of the present invention. The feature can also be a color code, a number code, a letter code and/or an operator code that is an attribute for the particular shape-identification element

and is taken in consideration by the processing unit when providing an output based on an activating and/or detecting of a shape-identifier in the effective range of this shape-identification element.

5 In a particular embodiment of the present invention, the output is reflective of a feature of the plurality of shape-identification elements that has performed the detecting and/or activating of at least one shape-identifier, whereby the feature can be: a number of readers activated and/or a number of previous activating steps.

10 In a particular embodiment, the educational toy set comprises a memory unit for storing a sequence of detecting and/or activating of at least one shape-identifier(s) by any one number of reader(s). The memory unit can for instance comprises a random-access memory, where all the detecting and/or activating events are at least temporary stored to be processed by the processing unit.

15 In a further particular embodiment, the educational toy set comprises a further memory unit that stores a collection of auditive output files that the processing unit can access when determining an appropriate output reflective of the shape feature(s) and/or shape-identification element feature as described above. These auditive output files can comprise for instance voice recordings of particular features and instructions which the processing unit can select from.

20 In a particular embodiment, the educational toy set of the present invention comprises a wireless communication unit. This wireless communication unit can for instance be used to connect an educational toy set with the internet and provide access to a memory or a database on the internet, where the processing unit can access auditive output files and/or store sequences of activating and/or detecting as described above.

25 In a particularly preferred embodiment, the educational toy set is further adapted to process in conjunction with a machine learning protocol. The machine learning protocol is used to process user data as the educational toy set is used. Particular sequences of events of activating and/or detecting can be used to identify recurring patterns or clusters of use and thereby provide directed pedagogic feedback on certain types of areas that are repeated. By analyzing the user data, it becomes possible to provide customized challenge levels for the user. If for instance the machine learning protocol recognizes
30 that the tasks are solved in very short time intervals and therefore can be considered too

easy for the user, more difficult tasks can be set by means of giving the respective instructions through the auditive signal output.

In a particular embodiment, the educational toy set does not incorporate any type of electronic display. By not incorporating a display the educational toy set is an ideal
5 complementation of the nowadays widespread use of tablet computers for educational and learning stimulation by providing an interactive experience with a strong tactile and auditive component that is in balanced in visual stimulation, performed by means of the shapes, and not favoring one sense at the expense of the others. The educational toy set is thus a screenless toy, that is still interactive in its use.

10 In a particular embodiment, the machine learning protocol is adapted to process data of a plurality of educational toys as they are used. This can lead for instance into a buildup of a significant user database that can be used to target specific areas where a pedagogic need has been identified based on parameters as for instance area, hour of the day, length of use and any other variables that the users would consent sharing in
15 an anonymized fashion with a provider of the educational toy set.

In a particular embodiment, the wireless connection unit of the educational toy set is further adapted at providing an update means for updating a computer program product that controls the operation of the processing unit.

In a particular embodiment, the wireless connection is an interface. In a further particular
20 embodiment, the educational toy set of the present invention comprises an interface for connecting the processing unit with at least one further information processing device. This can take the form for instance of an USB capable protocol for interface and the respective connection witch preferably is either one of a standard and/or a mini and/or a micro USB connection of the latest generation as would be deemed practical by the
25 skilled artisan.

In a particular embodiment, the educational toy set comprises a plurality of effective ranges, each for a particular reader and the effective ranges are adapted so that they do essentially not overlap. Alternatively, they can be arranged to overlap in selected
30 overlapping regions, which is then exploitable by providing overlap regions that enable a more specific activating and/or detecting of shape-identifiers in said regions. Particular shapes can comprise shape-identifiers that interact with a plurality of readers for instance

and thereby bridge one or more shape-identification means. This can trigger a specific auditive output by the output unit as processed by the processing unit.

In a particular embodiment, the shape(s) comprise at least one shape-shield that can, for instance, take the form of a radiofrequency electromagnetic wave blocking material
5 arranged inside the shape in a manner that the shape identifier, for instance a tag, is only accessible and can therefore only be activated and/or detected from a particular angle. This can enable the shape to be attributed with a plurality of features. A shape in the form of a cube, for instance, can be attributed with six different features, each reflective of a particular cube surface and associated with a shape identifier whose
10 reading is only possible if correctly placed in a shape identification elements with the shape identifiers from the other five shape identifiers reflective of their surfaces each are blocked from being read by a shield inside the cube.

In a particular embodiment, the outputting in conjunction with the one or more shape feature(s) is reflective of a feature such as shape form value, a number value, a letter
15 value, a picture value of the shape, for instance.

In a particular embodiment of the present invention, the shape-identification element comprises at least one shape receptible adapted at receiving a shape such as to bring the shape into an effective range associated with said shape receptible.

In a particular embodiment, the shape-identification element comprises a plurality of
20 shape receptibles.

In a further particular embodiment, the shape receptibles match the shape in a manner such as to snugly made with the shape in question. Particularly preferred, the shape receptibles are designed as depressions on the play tray.

Alternatively, or in addition, the shape receptibles can be designed to comprise markings
25 and/or suitable icons, respectively iconography to match the shape such as to make the placing of the latter intuitive. This allows a reliable bringing of a shape into an effective range of a shape identification element.

In a particular embodiment of the present invention, the educational toy set has shape(s) that have a shape surface essentially made of wood. One advantage of having shape(s)

that have a surface essentially made of wood is because of the haptic properties of wood. Wood is warm to the touch and comes close to traditional toy bricks in look and feel such that a greater acceptance of the educational toy set of the present invention can be expected from the uses. Alternatively, or in addition, the educational toy set has shape(s)
5 that have a shape surface essentially made of plastic and/or cardboard. In a particular embodiment, the shape(s) have an interior volume that is fillable with an interior unit comprising all the electronic units, such as shape identifier(s) etc. In this embodiment, the surface of the shape(s) can be made of cardboard that is foldable into the particular shape and within which the interior unit is placed.

10 In a particular embodiment of the present invention, the processing unit is further adapted at prompting a user by means of auditive output by the output unit. This prompting can take the form of a spoken invitation to perform a certain operation. This can be done in a blank state, i.e. when yet no shape has been brought into an effective range of a shape-identification element in the form of an invite to do so all it can be prompted by a
15 sequence already present on the educational toy set. For instance, if a mathematical operation has been placed by means of a sequence of shapes fitted into respective receptibles of shape-identification elements the processor can prompt the user to place the correct answer, i.e. the result of the mathematical operation into a remaining free receptible. This can be followed further by an output stating whether the shape has the
20 correct number value representing the result of the mathematical operation.

In a further particular embodiment, the processing unit is adapted at generating a particular output signal reflective of a correct answer for being output by the output unit. This can be used to provide instant gratification for correct answers and thereby increase learning motivation.

25 In a particular embodiment of the present invention, the shape-identification element(s), the processing unit and the output unit and preferably also the shape receptible(s) are part of a play tray. The shapes are then separate and adapted to be brought into an effective range of at least one reader inside the play tray. This can be preferably be done by fitting a shape into a shape receptible. The play tray according to the present invention
30 can in this particular embodiment be also made such as to have essentially wood outer surface.

In a particularly preferred embodiment, the play tray provides a wood haptic experience which has only one small interface, such as a mini USB connection for connecting the tray with a further computing device that interrupts the surface. The tray can be painted or coated to reduce wear and increase longevity.

- 5 In a particular embodiment, the educational toy set is further adapted to provide haptic feedback. This can be in the form of vibrating units, such as eccentric rotating masses, piezoelectric actuators and/or linear resonant actuators, such as commonly incorporated in smartphones.

10 In a particular preferred embodiment, the play tray is made out of at least two form-halves which can be fit together and fastened, preferably without requiring screws that extend to the surfaces of the play tray and hold the electronic equipment, i.e. the shape-identification elements, the processing unit, the output unit and preferably also the interface and a power source on the inside.

15 In a particular embodiment of the present invention, the electronic equipment is part of a further detachable element, such as a sidebar that can be removed from the play tray which has only the readers in the form of antennas which then connect to a processing device that can be plugged onto the play tray.

In a particular embodiment, the educational toy set further comprises input means for providing an input for the processing unit. In a further particular embodiment, the input
20 means is a microphone adapted at converting sound into electrical information that the processing unit can process. Particularly preferred the processing unit is adapted for being voice controlled. This enables a controlling of the educational toy set without requiring physical control tools, such as switches, levers etc. It further improves on the screenless toy value, as the educational toy set can be adapted at being accessed by
25 means of voice control for setting difficulty levels, defining access time, and/or accessing track records and score keeping, for instance. In a particular embodiment, the educational toy set comprises a voice-user interface for speech-recognition based control of the processing unit. It would also be possible to connect the educational toy set with a further device equipped with a voice-user interface, such as a smartphone, for
30 instance by means of a short-wavelength UHF radio wave based communication protocol, i.e. by Bluetooth.

In a particular embodiment, at least two of a plurality of shapes are designed to be stackable. This can for instance be accomplished by having the shapes made in the form of cubes.

It is evident for the skilled artisan, that an implementation of the present invention can
5 take the form of a combination of any of the described particular embodiments, as long as they do not mutually exclude themselves. Further an implementation of the present invention can comprise further structural or functional features out of the following method.

One aspect of the present invention relates to a method for generating an auditive output.
10 In particular the auditive output is generated by means of an educational toy set as previously described. The method comprises a step of triggering a detecting and/or activating of at least one shape-identifier by bringing this at least one shape holding that shape-identifier inside an effective range of at least one reader. The method further comprises a processing the triggering dependent on at least one parameter which
15 depends on one or a combination of shape feature(s). The parameter can also depend on the number of shape-identifiers, the position of the reader and/or the time of the reading.

The method further comprises an outputting an auditive output by means of an output unit as a result of that processing.

20 In a particular embodiment, the shape feature(s) are reflective of any one or a combination of: shape form value, number value, letter value, picture value of the shape and the processing comprises setting that value in context with a sequence of shape feature(s) thereby generating a meaningful output which is reflective of the sequence. This output takes the form of an auditive output.

25 In a particular embodiment of the present invention, the processing unit matches the sequence of shape feature(s) with a set of predetermined operations stored in a memory. This can further include outputting the said predetermined operation by means of playing an auditive output file by way of a loudspeaker.

In a particular embodiment of the present invention the processing unit matches the
30 sequence of shape feature(s) with a set of predetermined operations in a memory.

In a further particular embodiment of the present invention the processing unit prompts an error notification if a sequence of one or more shape feature(s) does not match a predetermined operation stored in a memory.

In the following section the present invention is further illustrated by means of figures
5 and specific examples, without being limited thereto.

The skilled artisan further recognizes advantages implementation and embodiments by starting these examples. The figures are shown for illustrative reasons only and are schematic and not intended to be in scale.

Figures

- 10 Fig. 1 shows schematically an illustration of an educational toy set according to the present invention;
- fig. 2 shows schematically a play tray prompting the user;
- fig. 3a shows schematically a use step of the educational toy set of fig. 1;
- fig. 3b shows a subsequent use step of the educational toy set of fig. 1;
- 15 fig. 3c shows a final use step of the educational toy set according to fig. 1;
- fig. 4 shows a detail of a play tray and part;
- fig. 5 shows a series of alternative embodiment of the play tray of fig. 1;
- fig. 6a shows an inside look into a play tray, and
- fig. 6b shows a schematic inside look into a shape for use with an educational toy
20 set according to the present invention.

Detailed Description

Fig. 1 shows the most basic implementation of an educational toy set according to the present invention. The educational toy set here comprises a play tray 1 which is an elongated tray with an essentially wooden surface and two end pieces at the front ends. In this particular example the end pieces at the front end are made of a different material than wood. These can be advantageous for incorporating loudspeakers into the educational toy set, which might be easier to implement in a metallic front end piece than having respective bore throughs for the loudspeakers in a wooden piece. The front end pieces can further be designed to be removable, such as to be able to open the educational toy set and access the electronic inside. Preferably the front end pieces also house batteries and/or power source(s) for powering the electronic functions of the educational toy set.

In a particularly preferred implementation, the front end pieces are made of a material or coated with a material that is agreeable to the touch and/or provides a good gripping, such as for example a silicon and/or rubber material. Alternatively, the front-end pieces can also be encased in a wood surface.

The educational toy set of Fig. 1 has a number of five shapes 2, 3, 2', 4 placed on the play tray 1. As can be seen in the present example, each of the shapes 2, 3, 2', 4 has a respective number value or an operator value as a shape feature. Three first shapes 2, 2' have a number value and two second shapes 3, 4 have an operator value. Presently the shapes having a number value have a first shape with a number value 3 and a second shape 2' with a number value 2. The first shape with an operator value has a «+» sign that signifies an addition and the second shape 4 with an operator value has an «=» operator. Finally, the correct answer has been placed on the play tray 1 of fig. 1 in the form of a shape with the number value «5».

A use of the play tray and the educational toy set of the present invention can be initiated by the educational toy set in the form of a prompting the user to perform a certain task. This is illustrated in fig. 2, where the educational toy set invites the user to perform certain actions. In the present example no shapes are yet placed on the play tray and the play tray by means of loudspeakers emits an auditive invitation A: «Please place any one of the toy blocks onto the tray! ». Alternatively or in addition to that the educational toy set can issue an invitation to place a particular shape onto the tray B: «Please place the toy block with a number three onto the tray!».

According to the present invention the play tray is equipped with shape-identification elements that can detect and/or activate the presents of nearby shapes and a verification step can be performed according to a specific timer by a processing unit (not shown in the present figure) whether a respective invitation that has been prompted has been
5 fulfilled or not. The processing unit can then decide to either repeat the invitation or move on to issue another may be different prompt from the first one.

For the sake of the present example, in fig. 3a the user has placed a shape 2 in the form of a toy block with a number value 3 on it on the play tray 1. The educational toy set can then provide the output C: «Number three!». In the following then as depicted in fig. 3b
10 the educational toy set can issue the further invitation D: «Please place a toy block with an operator onto the tray!». This is interactively followed through until a complete mathematical operation is placed on the play tray upon which the following sequence of auditive output can be outputted: A: «Three!» E: «Plus!» F: «Two!» G: «Equals!» H: «Five!». This corresponds to a sequence of shapes that have been placed on the play
15 tray. A first shape 2 has a number value 3, a second shape 3 has an operator value +, a third shape 2' has a number value 2, a fourth shape 4 has an operator value =2.

A more detailed example is shown in fig. 4, which represents an end part of a play tray 1 according to the present invention with a shape 2 that has been placed in a first shape receptible. The play tray end part has a frontend piece 1.1 that is made of metal and has
20 loudspeakers on the side (not explicitly shown) through which the auditive output is played. A first shape 2 has been placed into a first shape receptible which is made so that the shape 2 fits snugly in it. The second shape receptible 1.2 is not filled with a shape. In the second shape receptible 1.2 visible is a shape receptible feature 1.3 which in the present example takes the form of a printed surface 1.3. This printed surface 1.3
25 can be used for providing certain tasks and features, such as place a shape of the same color as the shape receptible feature 1.3 into the second shape receptible from the left.

In this particular example the shape has three visible shape surfaces. The first shape surface 2.1 shows a number value associated with the respective shape. The second shape feature 2.3 can be printed with a particular color or design, for instance, to be used
30 in combination with a respective corresponding shape receptible feature 1.3 in a task that can be formed by the educational toy. The third shape surface 2.2 can be also implemented with a particular feature, such as a further color or for instance with a picture value, letter value or operator value. In the context of the present invention the

processing unit can process and provide an output depending on the context in which a particular shape is placed in conjunction with further shapes on the play tray. This means that a shape-identifier which is associated with an addition can also be associated with a particular number, such as for instance a "Two". Depending on the context in which

5 the shape is placed on the play tray the processor determines either by itself or by relying on a database which of the functions would be relevant for the specific context. The output is then provided to suit the respective context. In a specific example this can mean that placing two shapes with the value "two" in subsequent manner can be interpreted to mean "twenty-two" instead of just «two» and «two». Different variants on how shape

10 surfaces can be used for shape features are shown in fig. 5, where the shapes 2, 3, 2' are used for depicting numbers as line count, dice pips or as letters. Whereby in the instance of the line sticks in fig. 5 the result would prompt an output in the sense of «This answer is not correct, try again!». In the example of fig. 5 a tray is shown where a complex task is in the context of being given to the user. The task of fig. 5 can be started

15 for instance by placing a first shape 5 with the image of an apple onto the play tray. The following task can encompass the placement of subsequent shapes 6, 6' with letter values either writing out the word apple or it can encompass a task where missing letters are to be placed on the play tray in a specific order. It can also encompass the task of stating how many letters are missing in the word that has been placed on the play tray,

20 where the correct answer has been placed onto the first shape 5 in the form of a shape 2 with the number value 1. Another different task could be to count the apples by placing the correct endings such as one apple, two apples requiring one shape at the end, respectively requiring two further shapes at the end. It becomes evident to the skilled artisan that the possibilities of implementing the present invention are nearly endless. As

25 the shown shapes of the present example as already outlined in fig. 4 are simple cubes with six different surfaces already a near infinite number of operations can be implemented into an educational toy set consisting of a play tray and a set of between six and ten shapes in the form of cubes.

One particular advantage of the present invention is that in the example of fig. 5 the

30 shapes are stackable. This stackability requires that the play tray has the respective features for recognizing two shapes above each other, i.e. requires means to distinguish two shape-identifiers within an effective range of a reader.

Fig. 6a shows a play tray 1 for use with an educational toy set according to the present invention with parts of the cover removed, such as to allow a schematic view onto the

interior. From left to right a frontend piece is followed by a first shape receptible 1.2 with a printed surface as a first shape receptible feature 1.3. The n-th shape receptible is shown with the cover removed and has an RFID antenna 10 within a shape-identification element 12. The shape-identification element 12 is separated by the subsequent n-th plus 1 shape receptible by means of a shield unit 18, which is a metallic block interposed between the first antenna 10 and a second antenna 10'. In operation both antennas 10, 10' each provide for a unique and specific effective range of the antennas 10, 10' which take the place of the reader in this present implementation. After any number of such shape-identification elements a processing unit 11 processes detection and/or activation that is performed by the antennas and based on a sequence of activation and/or the shape feature(s) recognized by means of the individual shape feature tags that are placed inside the shapes and are inductively activated by the antennas 10, 10' generates an output that is emitted from an output unit 17 in the form of an auditive signal. This auditive signal has already detailed above is refractive of these shape features and/or sequence and timing of the placement in the respective shape identification elements. To update the software all to load a power source 14 a connection 13 is provided. In the present example the connection 13 is an USB protocol connection. The battery 16 can be any kind of rechargeable battery as are commonly used in peripheral devices.

In the present example the processing unit 11 can also access a memory unit 16 that has certain voice files stored or that provides a database of sequences that are logical and that the processing unit can check again to against to determine whether a specific operation makes sense and which the correct output would then be.

In the present implementation of fig. 6a the play tray comes further equipped with a TCP/IP microcontroller capable of WiFi communication with further devices.

In the present example the antennas 10, 10' are RFID/NFC antennas adapted at providing an effective range in the proximity of the shape-identification element, such that only a correctly placed shape is capable of being activated/detected such as to prevent interference between different shapes that are placed next to each other.

A shape usable for such a device is shown in fig. 6b. The shape 2 in the present example has two shape features that are dependent on two shape-identifiers 2.1, 2.2. In the present example the shape-identifiers 2.1, 2.2 are two passive tags that can be activated and/or detected by means of a RFID/NFC antenna in a play tray as described above.

With an educational toy of the present invention a toy is provided that stimulates tactile, visual and auditive senses of a child can pose a variety of learning problems and a playful approach to different topics while at the same time being highly customizable and interactive in its use in a way that does not lag behind the usual tablet implemented
5 educational apps.

Claims

1. An educational toy set comprising:
 - a. a shape (2, 2', 3, 4) having at least one shape-identifier (2.1, 2.2) corresponding to one or more shape feature(s),
 - 5 b. a shape-identification element having at least one reader (10, 10'),
 - c. a processing unit (11), adapted at processing a detecting and/or activating of the at least one shape-identifier (2.1, 2.2) by the at least one reader (10, 10'), and
 - 10 d. an output unit (17), adapted at giving an auditive output, reflective of the processing of said detecting and/or activating in conjunction with the one or more shape feature(s);

the shape-identification element with the at least one reader (10,10') is adapted at detecting and/or activating the at least one shape identifier inside an effective range of the at least one reader,

15 the educational toy set comprising a memory unit for storing a sequence of detecting and/or activating of shape-identifier(s) by any one number of reader(s), and wherein

the shape feature(s) are reflective of any one or a combination of: shape form value, number value, letter value, picture value of the shape and the

20 processing comprises setting that value in context with a sequence of shape feature(s) thereby generating a meaningful output which is reflective of the sequence.
2. The educational toy set of claim 1, comprising a plurality of shapes (2, 2', 3, 4), each having at least one shape-identifier (2.1, 2.2) corresponding to one or more
- 25 shape feature(s).

3. The educational toy set of any one of claims 1 or 2, comprising a plurality of shape-identification elements each having at least one reader and each having an effective range of the at least one reader.
- 5 4. The educational toy set of claim 3, where the output is reflective of a feature of the plurality of shape-identification elements has performed the detecting and/or activating of the at least one shape-identifier.
5. The educational toy set of any one of claims 1 to 4, comprising an interface for connecting the processing unit with at least one further information processing device.
- 10 6. The educational toy set of any one of claims 1 to 5, comprising a plurality of effective ranges, each of a particular reader, and the effective ranges are adjusted so that they essentially do not overlap.
- 15 7. The educational toy set of any one of claims 1 to 6, wherein the output in conjunction with the one or more shape feature(s) is reflective of a feature such as shape form value, number value, letter value, picture value of the shape.
8. The educational toy set of any one of claims 1 to 7, whereby shape-identification element comprises at least one shape receptible adapted at receiving a shape such as to bring the shape into an effective range associated with said shape receptible.
- 20 9. The educational toy set of any one of claims 1 to 8, whereby the shape has a shape surface essentially made of wood.
10. The educational toy set of any one of claims 1 to 9, whereby the processing unit is further adapted at prompting a user by means of auditive output by the output unit.
- 25 11. The educational toy set of any one of claims 1 to 10, whereby the shape-identification element(s), the processing unit and the output unit, and preferably also the shape receptible(s), are part of a play tray (1) and the shape(s) are separate and adapted to be brought into an effective range of at least one reader inside the play tray, in particular by fitting a shape into a shape receptible.
- 30 12. The educational toy set of any one of claims 1 to 11, whereby at least two of a plurality of shapes are designed to be stackable.

13. Method for generating an auditive output by an educational toy set according to any one of claims 1 to 12, comprising the steps of:
- a. Triggering a detecting and/or activating of at least one shape-identifier by bringing at least one shape inside an effective range of the least one reader;
5
 - b. Processing the triggering dependent on at least one parameter dependent on either one or a combination of: shape feature(s), number of shape-identifier(s), position of the at least one reader; time of reading;
 - c. Outputting an auditive output by means of an output unit as a result of that processing, and
10
 - d. where the processing unit matches the sequence of shape feature(s) with a set of predetermined operations stored in a memory.
14. The method according to claim 13, wherein the shape feature(s) are reflective of any one or a combination of: shape form value, number value, letter value, picture value of the shape and the processing comprises setting that value in context with a sequence of shape feature(s) to generate a meaningful output reflective of this sequence in the form of an auditive output.
15
15. The method according to any one of claims 13 or 14, where the processing unit prompts an error notification if a sequence of one or more shape feature(s) does not match a predetermined operation stored in a memory.
20