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Published version

EBENREUTER, Natalie (2009). When conventional procedures are no longer the rule for application: design as a discipline opens up to new possibilities. In: Undisciplined! Design Research Society Conference 2008, Sheffield Hallam University, Sheffield, UK, 16-19 July 2008.

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When conventional procedures are no longer the rule for application:

design as a discipline opens up to new possibilities

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Abstract

This paper discusses the development of the prototype application 'LabanAssist'. It looks at the design rationale used for the creation of what is fundamentally a system for recording dance knowledge on a score, as identifiable and replicable signs and symbols. A system made necessary because the conventions of other established disciplines, such as engineering and computer science practices, were no longer considered to be effective alone, in facilitating the production of well-designed cultural artefacts (Calvert, Fox, Ryman, & Wilke, 2005; Ebenreuter, 2005).

It is important to ask how can we understand design as a discipline amongst other fields of study with longstanding conventions and traditions and if the discipline of design offers effective ways of thinking about the creation and art of making products or services for the enhancement of the human experience? Is design a discipline because it adheres to existing and established rules of interdisciplinary knowledge from which it draws, or is it a discipline in its own right that as a significant field of intellectual development utilizes interdisciplinary knowledge as a basis for creativity and invention?"

While there is no simple answer to these questions, the design approach adopted for the development of the prototype application 'LabanAssist' offers a working example in which the central theme of grammar, or more particularly the rules of a language, depart from the conventional use for its practical application. This application is one in which a literal understanding of grammar is no longer seen as an adequate basis for the generation of dance knowledge expressed via symbolic writing systems. Instead, this research focuses on the way in which the figurative aspects of language can be represented in the design of an interface to orient user thinking and facilitate the generation of diverse movement compositions.

Keywords

Labanotation; Grammar; Literal; Figurative; Tropes; Poetic Constructs; Broad Terms; Interface.

Contemporary society relies on many forms of conventional practices, strategies, customs and social behaviours to operate effectively. Typically, we recognize these as terms of reference for agreement in areas such as international policy, law, and industrial negotiations established to bring about cooperation between organizations, institutions and communities of different countries. More commonly these conventions can be understood as a

language or a means of communication that facilitate the active exchange and recording of ideas. This communication or interaction provides a means in which we can systematically preserve and foster the knowledge of our cultural identity, customs and traditions, as well as intellectual and technological advances. To facilitate this symbolic writing systems offer a way to share and disseminate knowledge to a wider community for the possible participation by literary or scholarly practitioners.

The approach taken to design 'LabanAssist' a prototype application that assists the reading, writing, and visualization of movement through the use of a symbolic writing system is the subject of this research. This research seeks to add to the growing body of knowledge that illustrates how design, as a discipline, can provide an effective way of approaching the creation of products and or services that will enhance the human experience. This has developed in part as a response to what will be argued is the failure of the conventional ways of thinking and working to address the diversity that exists within the community of use, for which we design.

Through this research a plausible example of a foundation for the generation of new knowledge structures and how this can be understood and integrated into the design of a product, by entering into the experience of others, is sought. To achieve this it takes the imagination of others, or a unifying idea, as a primary factor that will shape the creative process of composing movement. As a result the approach described does not rely on the construction or manipulation of a known set of variables but instead opens up the possibility for diverse interactions, that when combined offer a reformulation of a dynamic set of circumstances. It is envisioned that this research will provide a useful example of how the application of design thinking to the conception and development of a creative computational tool will enhance the knowledge of the foundation of design products and the discipline of design as an integrated and an holistic practice.

A Grammar for the Composition of Movement

Movement can already be described in symbolic language. One such language, Labanotation is used for the preservation and visualization of dance scholarship. In the same way that musicians notate the tone, pitch and duration of sound as scores of musical notes, members of the dance community can document movement as dance notation scores using the symbolic vocabulary of Labanotation (See Figure 1).

The skill required to document movement, as symbolic scores is well know at the professional level of a Choreologist. However, for the purpose of this research the intended community of use are members of the dance community who have little knowledge of Labanotation. For that reason, it is argued that an objective or rational understanding of the systematic rules of a language alone, will not offer explicit information about the potential use of a writing system for the creative expression of contemporary dance forms. If taken as a basis for the construction of movement a grammatical analysis of the underlying parts of a language cannot provide an adequate structure for the design of a prototype application that will facilitate the creative and diverse composition of signs and symbols. This is because a method of analysis

that seeks to identify and determine distinct properties of existing symbols and grammatical structures is a largely predetermined and individualistic activity.

Characteristically design involves the invention and formation of novel structures, whereas science generally concerns the discovery of the components of existing structures (Cross, 2001). By examining the least parts or components of a design situation, a foundation is created for the construction of a design outcome in which the designer's perspective is impartial to productive processes. This is done in order to generate what is arguably a valid outcome. However the very nature of experience is central to the composition of movement. This is not only with regard to the physical understanding of performative movement but also with the knowledge of a vocabulary that can preserve and cultivate the art of movement. A scientific form of analysis, which is predicated on the basis of known entities, therefore, leaves little room for the possibility of creativity or innovation. Analysis in this sense subscribes to the very rules and conventions it utilizes to explain individual components of a language that when combined build complex relationships between known signs and symbolic structures.

This is important because lack of a sign system, in which it is possible to derive distinct or inherent meaning from the reading of a symbolic message, underpins the paradox Barthes (1977) describes, of a message without a code. A situation where prior knowledge of a sign or lack thereof is tied to our ability to successfully read and identify with symbolic messages. This is particularly apparent when members of a specific community are faced with the task of facilitating the use of arbitrary symbols to illustrate imaginative ideas in unanticipated situations of use. This is relevant because, when symbols are used to represent the knowledge or the conventions of a specific group, they become the objects or the tools for the documentation, preservation and dissemination of ideas. Of particular import are situations in which the context for gaining an understanding of a symbol is not known from prior experience, because the knowledge of a symbol will be bound in the perspective we bring to bear upon the image for its interpretation.

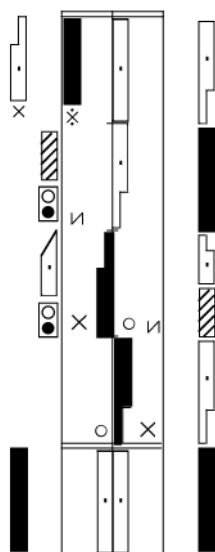


Fig 1. Labanotation Score (baseball pitch)

Symbolic Communication

For Saussure (1983) the linguistic sign or the signs of a language have little value in isolation. It is not until the relationship of two or more signs may be compared with one another that their character is revealed (Saussure, 1983). If we accept that a symbol works to distinguish one person, object or thing from another, then we can begin to understand the utility of a symbol as the confirmation of action and cooperation between at least two members of a like-minded community (Z. K. McKeon & Swenson, 1998). The use of symbolic writing systems for the communication of information or knowledge regarding the practices and traditions of a specific community, provide powerful tools for the presentation of thoughts and ideas that prompt actionable outcomes.

With this in mind, communication in this sense is not universal in its ability to communicate, rather it is circumstantial and open to interpretation by the members of the community for which it holds significance (Aristotle, 350 B.C.E). A good example of this idea lies in the understanding of poetry. For if a poem is understood, as it actually exists in its material form it represents an object or thing as lines, marks or symbols. However, when read poetically it produces a series of experiences. Communicated as thought, action, images, sound, quality and intensity, the experience is unique in comparison to the variety of ways in which poetry can be sensed and felt by an individual. Moreover, such an experience is separate to one's prior knowledge or familiarity with the subject matter being explored (Dewey, 1980). This is based on the understanding that the relationships we develop with symbols, regardless of their intended use, may be as diverse as the uses we have for them.

For Mead (1934) the meaning of an object is established by an individual or community for which it is an object. Where individual meanings arise as a result of a willingness to actively engage with an object, as opposed to the notion that an object is the embodiment of an uncontested and discernable meaning (Mead, 1934). A disposition toward the reading of a newspaper as a source of information could provide the newspaper with a meaningful connection to newsworthy events. However, without the experience of treating a newspaper in this manner, it may find greater use as packing material for the storage of precious items. This suggests that objects do not embody an inherent meaning with a certainty shared by all. As Mead (1934) suggests the relationship between an individual and an object represents a range of possible meanings, which bring forth a variety of different human responses.

As human beings we are not merely the passive receptors of information. We think, feel and act intelligently during the course of interacting with one another and the immediate elements, or things that constitute our surrounding environment (Dewey, 1980). This notion of humans as active receptors impacts upon the relationships we form for the use of symbols including Labanotation symbols used for recoding dance movement. However, there are movements that have still not found expression within a distinct set of rules and symbolic conventions. Because of the dynamic nature of language, Labanotation is under continual development as is all language at the level of communication. This highlights the problem of naming abstract ideas as

expressed by symbolic language systems. As these remain arbitrary until they are made known, through their personal and public use by means of documentation, physical and verbal expression. Therefore, facilitating the use of symbolic information or transforming it into useful objects of knowledge for the description of movement can be said to depend largely upon the approach one takes to gain an understanding of its vocabulary. This is where a description of movement stems from its conceptual understanding to its material composition in reference to its physical performance.

For Aristotle the objects of true knowledge are not absolute and suprasensible entities, but rather the formative aspects of things as these aspects are abstracted by the activity of the intellect. To have true knowledge of a thing, therefore is to have knowledge of its inherent form (Ruben, 1989 p.34).

The meaning we attribute to symbols is, therefore, as a result of the relations we develop in the act of constructing form (Turner, 1991). Where the distinction between 'doing', that is the ability to take action as opposed to 'undergoing' an enforced course of action is significant to the experience of forming matter (Dewey, 1980 p.137). The notion of 'doing' can be understood as an interactive process that contributes to the unity, quality, understanding and experience of form (Dewey, 1980). Language, such as Labanotation, can be understood as symbolic action (Blumer, 1969; Burke, 1969a) in the composition of movement as dance notation scores, rather than as a mode of knowledge.

Topes as Poetic Constructs

The ability to experience and learn, however, can become confused. 'Symbol shock', a term coined by Marion (personal communication, October 16, 2006), refers to an inability, faced by novice users of Labanotation, to identify with the vast majority of abstract symbols it encompasses. As a result, this impedes one's ability to take action or interact with its symbolic language for the description and interpretation of movement. To counteract such shock or failure to take action, Barthes (1977) suggests that the linguistic message, at a literal level, must provide a technique in which the identification and understanding of indistinct signs work to guide the relationship developed for the comprehension of a symbolic message, as opposed to its connotation. For Burke (1969b) the connoted or suggestive meaning of an image or idea is confused in the sense that upon its analysis, a connoted message can never fully divulge the extent of that to which it refers, or be successfully indicative of its corresponding meaning whether it be of an intellectual, imaginary or practical basis. This is where 'productive poetic imagery' gains significance (Burke, 1969b p.86). It enables one to create an image of an idea that represents a conceptual understanding of movement and to make or produce it in a symbolic form. Developed from the imagination Burke (1969b) tells us that the poetic image can facilitate the creative expression of ideas never before seen or experienced. An ability to underpin the creation and representation of innovative ideas, as imagery that stems from the intangible to a tangible representation, is beneficial to members of the dance community in the preservation of movement as dance notation scores.

The prototype application 'LabanAssist' will use terms in the design of the interface. These will differ in their representation by functioning as poetic constructs to make this possible. These poetic constructs, which are illustrated by text or words and express these broadly defined terms, provide a point of reference, which contribute in part to a complete description and representation of movement. Poetic constructs capture the circumstances surrounding certain types of movement. Through an interactive process of identification, association, selection and modification the discovery of the range of possibilities offered by the representation of broad terms used to describe movement, underpin their conceptual formation. Users become familiar with a flexible use and application of language that enables associative means of thinking and working to develop in the concrete documentation of movement by manipulating a malleable display of terms that illustrate the verbal vocabulary of Labanotation. This is in opposition to utilizing the names of Labanotation's symbolic vocabulary to describe movement. Indicative of Burke's (1969b) 'poetic image' this process enables the manipulation of verbal terms as conceptual ideas and images to extend beyond the practical or positivistic qualities of movement.

For Barthes (1977), a written symbolic message as descriptive text or words, works to orient one's thinking by giving focus to a message or ideology. However, this is not necessarily literal in the sense to which Barthes suggests. Because as Turner (1991 p. 151) explains precise meanings diverge from a fixed or literal point of reference in a 'play of tropes'. Tropes are constructs that enable insight to be gained into different perspectives and understandings as a result of conceptual repositioning. Through the overlapping and merging of a variety of meanings derived from literal terms they give shape to an idea or image. In doing so, they allow the transformation of the literal to the figurative and thereby open up a range of possibilities associated with specific subject matter or theme, which can then be explored. Essentially tropes provide a starting point in which to begin and develop individual interpretations and meaning. The function of tropes could just as easily be substituted by the notion of terms previously described. The significance of poetic constructs enables an individual to work within a set of circumstances, which are not determinate or absolute. Instead they offer a conceptual place in which to interpret and then shape the necessary elements of a given situation. For Turner "...both tropes and cultural structures are constructed through a 'play of tropes', a dialectical process in which meaningful wholes are simultaneously integrated as parts of larger wholes and differentiated into new patterns of relations among their own parts" (Turner, 1991 p.150).

Labanotation offers a means to facilitate a dialectical progression of diverse and innovative ideas to the logical composition of movement. This is made possible through the rhetorical design of an interface for the prototype application 'LabanAssist'. For as Burke (1969a) suggests the correlation between perception, that is how we view a situation and what is actually perceived are equally representative of one another.

Therefore symbols, whether written as text, numerals or glyphs, will encourage interaction. Not because they represent a clear literal understanding of terms, but because of the broad nature in which they provide a basis for meaning

and action, which underpins their effectiveness and subsequent use (R. P. McKeon, 1987). This is not based on reasoning alone, but the combination of both emotion and reason, which for the purposes of this research, are essential to the artistic conception of movement, its composition or choreography and symbolic description (R. P. McKeon, 1987). In this way thought is transformed from the figurative formation of ideas, to a symbolic description of movement via its conceptual creation, its description in broad terms, and subsequent tangible or concrete representation as dance notation scores.

The Boundaries of Grammar

The involvement of potential users of a system is essential when devising an appropriate course of interaction to assist a diverse description of movement and the potential combinations of its elements by envisioning a flexible structure to guide its composition. This is because how one conceives, performs, speaks and documents movement differs significantly in their various forms of expression. Due to the nature of this diversity the correct syntactic and grammatical formations of symbolic writing systems in language pose distinct challenges to the construction and communication of dance knowledge. In terms of the technical communication of dance knowledge, by members of the dance community who rely on such notation systems, the formation of these symbols have little relevancy as a guiding principle for their correct structural composition. The grammar rules that underpin the structure of Labanotation reveal very little about the practice of their art in application to the composition of dance notation scores. By developing a prototype application that removes the need to have specific knowledge of these rules, a structure that corresponds to the theory that supports it, needed to be developed so that its underlying principles may be understood implicitly through actively engaging with the functionality it provides.

Critical to the success and long-term usefulness of the prototype application 'LabanAssist' are high-levels of flexibility that enable users to progress, regress and revert, specific actions within a restricted sequence of interaction. This interaction is necessarily confined by the grammar of Labanotation. However, the kinesthetic knowledge and range of motion imaginable, that is physically possible to perform, will expand and open up the boundaries in which this movement is expressed. In support of this Chomsky equated grammar to a model of linguistic intuitions (Radford, 1981). This is because native speakers of a language have the capacity to make intuitive judgments about the adequacy of the form and structure of sentences (Radford, 1981). Based on the concept of a universal grammar, such judgments are as a result of individual beliefs, verbal language skills and knowledge concerning what is and is not plausible (Smith, 1999). Therefore, a repertoire of movement knowledge and the verbal vocabulary of Labanotation supply a foundation for similar judgments to be made by novice users of the Labanotation. The conventions of Chomsky's transformational or generative grammar suggest that there exists an intimate relationship between the deep structure of language, its syntax, and the surface structure of a language, its semantic interpretation (Smith, 1999). Meaning is acquired as a result of the interplay between the two in which the underlying structure of language gives emphasis to its understanding. However, this did not lead to the notion that

syntax is a reflection of the surface structure of a language (Chomsky, 1977). Instead, Chomsky (1977) tells us that there is connection between the ideas we create and the forms of syntax but that this does not stem from the rules of semantics or syntax to their compositional form. He suggests that "We might, then, loosely think of a transformational grammar from a semantic point of view as a mapping of a structure of thematic relations onto a kind of "logical form" (Chomsky, 1977 p.59).

The significance of this argument is that it explains how seemingly arbitrary symbolic representations become meaningful and useful to the generation of language structures or sentences based on what we ourselves produce. If we accept the notions put forward by Chomsky, then we begin to understand how the boundaries of formal grammar can work to increase the potentialities of language through the concept of transformational grammar.

A Basis for Interaction

In light of this Burke's (1969a) method of dramatism can be adopted to develop an approach that encourages or motivates the use of thought and language as modes of action to facilitate the symbolic creation of dance notation scores. In treating the concerns of the symbolic, or the formulation of conceptual ideas, Burke (1969a) turns to rhetoric, the art of delivery, to enhance symbolic communication through ordering, arrangement and display. This is in combination with and the art of making or design, also referred to as Poetics or Productive Science, and is a means to create and represent the figurative aspects of thought and language, which are as a result of the dialectic formation of ideas and interactive perspectives. In this way the representation of symbolic communication exhorts a course of action through its capacity to put into practical terms a way of interacting with the unfamiliar. These terms are represented in the design of an interface as words, labels or images and can be used to accommodate the ephemeral nature of movement without distinct reference to its precise or probable description, illustrative of the notion of tropic interplay (Turner, 1991). Since no two movements are identical in performance, identification or description, a synecdochic relation between what is understood in relation to a symbol or label that represents this in the interface will assist interaction. This interaction occurs through the provision of an implicit representation of possibilities that enables the transformation of ideas to move from the figurative to the symbolic in the course of notating movement as dance notation scores (See Figure 2). Therefore, the manipulation of arbitrary symbols, through the broad selection of labels, makes possible greater interpretation and understanding of their meaning. This leads to the development, through the changed conditions, of an interactive situation. Where interaction or communication is in a symbolic sense, in the representation of the interface, and in an individual's conceptual understanding of their actions through experiential learning. It is also communicative in the sense that the participating elements of the situation, are equally transformed and effected by the experience (Dewey, 1967).

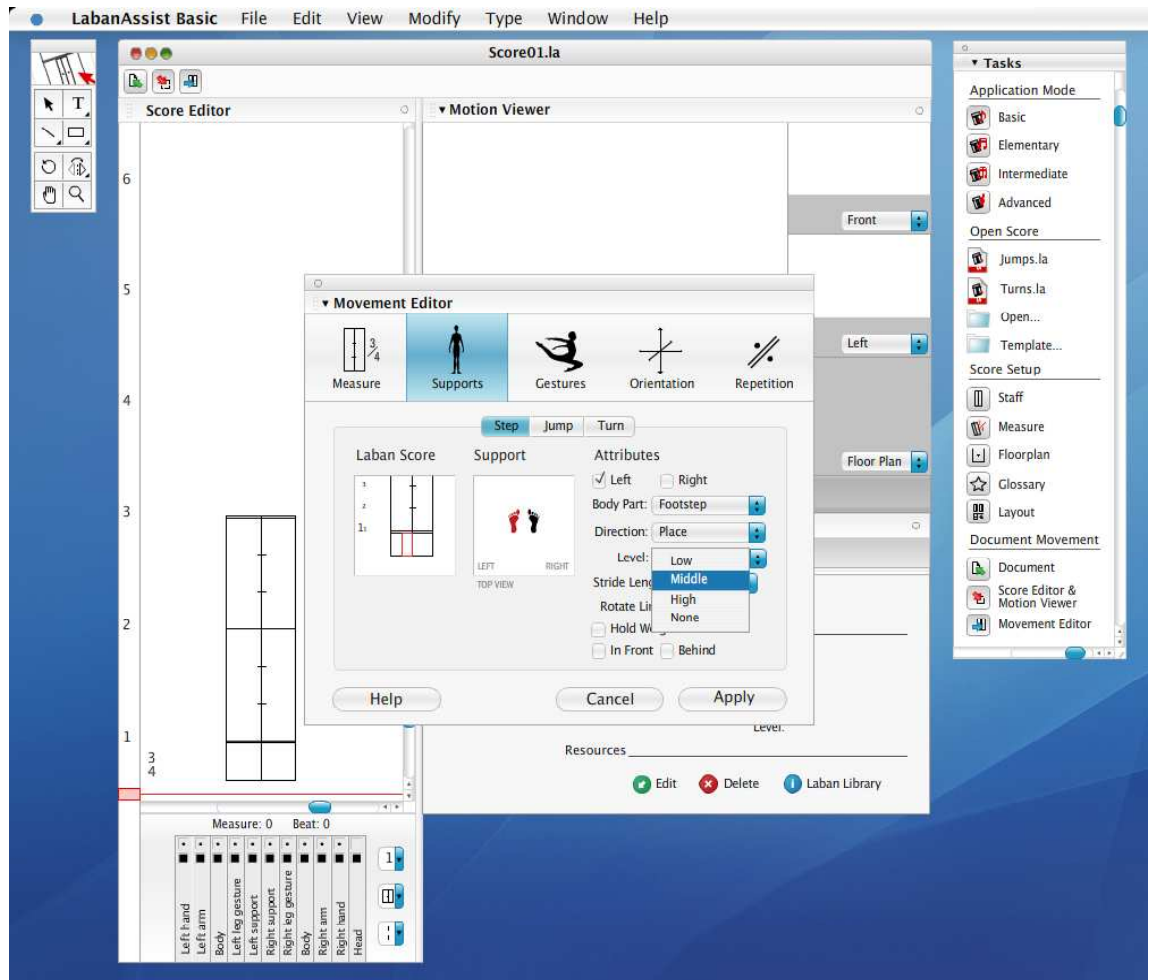


Fig 2. The interface of LabanAssist

Transformation to the Interface

It is essential to have a visual interface that supports the potential for communication of interactivity possible during the process of documenting movement. To assist this communication, visual representations that illustrate associations between language and thought as Labanotation symbols and animated movement will be helpful. This is achieved by communicating elements of identification, choice, significance and action. However, it often becomes challenging for a designer to integrate these associations into a digital environment when the elements of choice, that is to say Labanotation symbols, are difficult for users to identify and interpret. This is because the semiotic value or surface structure of Labanotation symbols offers little assistance in communicating knowledge of their meaning.

It is therefore important to understand fully the principle that tropes, as poetic constructs work to orient conceptual thought and open up the potential for a variety of concrete possibilities. For the purpose of this research the representation of broad terms in an interface, those that follow the verbal vocabulary of Labanotation, do so to facilitate the transformation of an arbitrary description of movement to generate new possibilities. Drawing on the theory of transformational grammar the idea or concept behind a description of movement may be represented symbolically in an interface as

a result of interactivity. This is achieved through the selection of any possible combination of terms that contribute to the formation of movement and are illustrative of the idea or thought that lies behind their expression. As an available resource this is useful where the abstract verbal terminology of Labanotation works to assist the poetic construction of movement that has not yet been fully imagined or experienced. This will facilitate the composition of movement to be described and documented as Labanotation scores.

The use of this terminology assists the process of movement composition by offering a place or a starting point from which to generate a description of movement. This is based on the selection of broadly termed descriptions of movement that follow the practice of composing Labanotation scores and are relevant to the physical positioning and attributes of movement in three-dimensional space. While this provides an underlying structure for the interactive description of movement it is not restrictive in the sense that an end-user of the system is offered a fixed set of terms to describe movement. An example of this is illustrated in Figure 3; where the terms body part, direction and level, open up the potential for diverse descriptions of movement to be created via the selection of associated menu items in the interface.

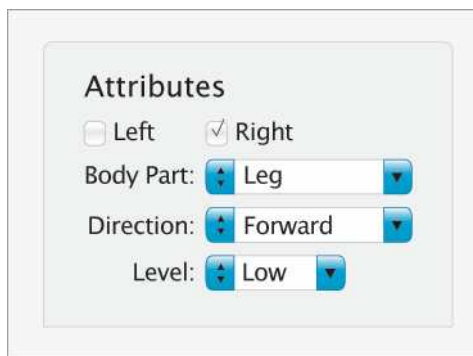


Fig 3. Movement Attributes

When broad terms that form a relationship, relative to a description of movement, are also coupled with analogous images of its representation and corresponding Labanotation symbols, the combination of these elements function to assist the understanding and subsequent use of Labanotation. In this way a novice user of Labanotation may identify the shapes of Labanotation symbols and their positioning on a score more easily, by visually comparing them in relation to the terms in which movement is described. This also extends to the associations made through corresponding image representations.

Figure 2 illustrates the default setting of the interface design for the prototype application 'LabanAssist' before a description of movement has been specified or documented on the score. It is important to understand that the provision of the system to assist the interpretation and practical application of Labanotation symbols is made possible once a description of movement has been specified through the selection of key terms. The visual association of imagery to the description of movement is in no way intended to present a connotation of a term to the end-user. If this were the case however, the representation of such imagery would be suggestive of the meanings surrounding the use of a term. Imagery would then function to define the

objects to which they were associated prior to their selection by projecting meaning in the interface. It should therefore be understood that the purpose of the prototype 'LabanAssist' is not necessarily one of projecting meaning in the design of artifacts; rather it is one of guiding the formation of ideas through interaction.

The delayed response of analogous images and Labanotation symbols with regard to the description of movement functions to provide a broad outline and representation of their description. In this way the visual representations, offered as a function of the system, encourage interaction based on the creativity surrounding the composition of that movement. Contrary to the notion of providing a distinct or literal representation of the terms used to describe movement, artistic imagination is therefore, not hampered or confused by the misrepresentation of movement between the function of the system and the user's understanding. 'LabanAssist' relies on the imagination of the end-user or artist to guide interactivity based on his or her own unique individuality of thought and action. This in turn enhances the experience of the user and makes the exploration and generation of movement possible. The scope in which the selection of broad terms, presented in the design of an interface, function to assist variety and choice, will then work to posit user thinking. The resulting scope and interactions, together with the production of poetic imagery as concrete symbolic representations is made possible.

Discussion

The development of the prototype 'LabanAssist' offers a working example in which the central theme and treatment of grammar departs from the conventions of formal language structures. The design approach taken for its development focuses on the figurative aspects of thought and its documentation, which deals with the interaction between the conception, description and representation of the symbolic. This is where the reduction of ideas to physical things is not considered in its least parts or in an objective deterministic view. It is synoptic in its method of reduction and offers a system of placement for the representation of observations as an integrated and organized idea, thus resulting in a unified composition (Burke, 1969a).

More of a summation than a reduction this system of placement embodies the complexity and extent of its constitute parts in a symbolic form. As with a mapping function, Labanotation scores systematically illustrate the relationships between the nuances of movement and its interconnecting parts. The significance of this lies in the overall composition of movement. This allows for a fuller appreciation and the provision of a deeper understanding of the motivation or impetus behind the actions it represents and its re-enactment from symbol to action. This re-enactment gains momentum through the design of the interface for 'LabanAssist'. A design that is able to use poetic constructs to facilitate the symbolic composition of ideas in action. This is because fundamental to the development of 'LabanAssist' is the provision for an understanding in which design as a discipline can offer a way of working and thinking with the elements of a design situation, so that the opening up of innovative solutions is possible. This is an outcome that is not usually considered within the conventions of other fields of study.

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