

## DESIGNING THE TEACHER LIKE BEHAVIOR OF E-LEARNING SYSTEM: A CASE STUDY OF INDIAN SCRIPTS TYPING TUTOR

By Dr. DINESH S. KATRE

Centre for Development of Advanced Computing (C-DAC), Pune 411005, India.

### ABSTRACT

*Transactional Analysis (TA) of teaching and learning process reveals actions and reactions triggered from the ego-states of teacher and learner. The teacher has to switch between these ego-states to achieve effective communication and learning results. Ego-states of teacher and learners are worth studying in the context of e-learning, as the e-learning system has to emulate the teacher's behavior. Present problem is how to integrate the behavior of teacher in the system. This paper presents the behavioral models of interactions between teacher and learner. The case study of Indian Scripts Typing Tutor software is presented to show how some of these behaviors are modeled and incorporated with consideration of ego-states. It has helped in the design of interface metaphor, interaction, dialogs, color schemes etc. Indian Scripts Typing Tutor is being developed for school children and adult learners.*

**Keywords:** Transactional Analysis, Ego-states, Human Computer Interaction (HCI), e-teaching, e-learning, Interface Metaphor, Instruction Design.

### 1. INTRODUCTION

Most e-learning systems have proven their capabilities in administering the course conduct and delivering the courseware through network in an asynchronous way. But for live interaction with the teacher one has to adopt synchronous approach (Mudur, 2005). The much-embellished term 'self-paced learning' has reduced itself to 'learn at your own' without enough guidance. It is much harder and worse (Clark, 2000) than the conventional learning process wherein at least the teacher is available for guidance. The skepticism of how much a learner can really learn from such e-learning systems continues to bother us even today.

The concept of e-learning is contiguous with e-teaching. In other words, the concept of e-learning can exist only if there is e-teaching. But the reality is quite different, as most of the e-learning systems don't teach at all but merely present the courseware. In addition to the courseware, the e-learning systems need to be supported with knowledge, intelligence and teacher like behavior. Without these three elements, e-teaching and the resultant e-learning is just unthinkable.

On the other hand, the e-learning system should be able to identify the learner for selecting appropriate teaching content and the teaching style. The learners can be identified based on innumerable parameters like age, sex, ego-states, social and cultural background, education, technical skills, cognitive abilities, interests and several known and unknown human dimensions. Researchers are trying to incorporate these dimensions in adaptive e-learning (Stash et al, 2004). However, as a humble contribution to this domain of research, we have experimented with Transactional Analysis (TA) and ego-states (Berne, 1996) during the design and development of Indian Scripts Typing Tutor software. The observations and the outcome of these experiments are reported in this paper.

#### 1.1. Indian Scripts Typing Tutor

Indian Scripts Typing Tutor software is developed by C-DAC's National Multimedia Resource Centre, Pune. It is being developed for school children as well as adult learners. It provides training to develop typing skills in Indian scripts. Large percentage of computer users in

India are inhibited to use the Inscript keyboard which is specially designed for typing in Indian scripts. The prime reason behind this is the strong unlearnable impact of English keyboard. As a result, most computer users have a difficulty in switching over to the Inscript keyboard. Therefore our main challenge in this project is to overcome the inhibitions or hesitation of computer users in typing Indian scripts. This project has four types of design activities-

- Learning Content Design
- Software Design
- Interaction Design
- User Interface Design

In this paper, we are concentrating on interaction and interface design issues of the proposed e-learning system, as they are the key constituents of its behavior design. The behavior of the system articulates its personality, which is 'teacher' in this case. In this experiment, we have used the knowledge of Transactional Analysis (TA) for interpretation of interactions. We will be referring the most commonly found ego-states among humans, which are defined by Berne (1996) as child, adult and parent ego-states.

## 2. Transactional Analysis and Ego-states

Transactional analysis of teaching and learning processes reveals actions and reactions triggered from the respective ego-states of teacher and learner. The teacher has to adjust with the ego-state of the learner for effective communication and learning results. Communication between similar or complementing ego-states is usually very effective. Otherwise there is a possibility of clashing ego-states that can hinder the learning process. As the outcome of our transactional analysis, we have modeled some basic behavioral patterns. These models are conceived from the perspective of e-learning system as the teacher. The behavioral 'OK corral' (Ernst, 1971) is used for illustrating the interaction models. These are discussed hereafter.

'Self-assumption: I am OK' status is attributed to the proposed e-learning system, which has to emulate the teacher like behavior. The teaching system can't afford to be in self-doubt. It is expected to be authoritative like a teacher and therefore it is attributed with 'I am OK' status as per the OK corral.

### 2.1. Accusing Behavior

Figure 2.1 shows the model of accusing behavior, wherein the e-learning system assumes that it is always correct and the learner is wrong. It is a legacy, which computers have passed on to e-learning systems. The computer software has been following 'accuse the user' model since its inception. Such accusing behavior is a result of teacher-centric behavioral psychology (Hofstetter, 1997), wherein the teacher builds the schemata through a set of instructions and the students have to fit in or comply with it. Non-compliance with the instructions, results into blaming or accusing remarks from the teacher. Similar behavior is manifested through the dialogs that are flashed before the software users.

The teacher-centric behaviorist approach to training proposed by Skinner (1953) has produced effective results in animal training. If the learners are accused for making mistakes, they are unlikely to participate very well in the learning process. Their receptiveness gets switched off due to rudeness in the expression of feedback. Therefore, such accusing behavior should be discouraged in e-learning as far as possible.

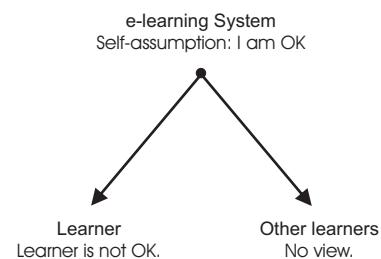


Figure 2.1: Accusing behavior

## 2.2. Guiding Behavior

e-learning developers have not taken conscious efforts to differentiate between the teacher-centric and the learner-centric approaches while designing the e-learning systems. These are formed on the basis of behavioral psychology and cognitive psychology. In the modern context, one would recommend cognitive learning approach (Bruning et al, 1995), which is highly learner-centric. In this approach teacher has to facilitate and guide the knowledge formation process for the learners.

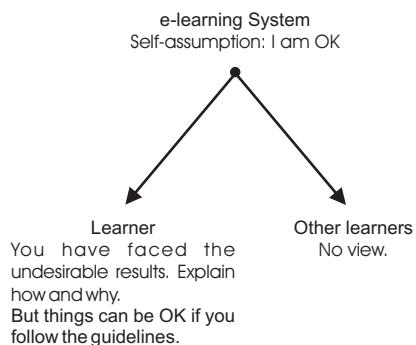


Figure 2.2: Guiding behavior

In this approach, teacher does not build the constructs or schemata while teaching but provides the required guidance if the learner is stuck up or mistaking. While dealing with young learners, the teacher or the e-learning system can directly point out their mistakes followed by its explanation and the guidance to overcome it. Politeness is integral to guiding behavior, which is explained in 2.5.

## 2.3. Idolizing Behavior

The teacher idolizes by quoting other students who are doing better than the one in question. The e-learning systems never idolize. Such idolization is intended to inspire and motivate the students to improve further or to take more efforts. E-learning systems can incorporate this type of behavior for motivating the learners as it usually stores the comparative data of performance by other learners. Refer figure 2.3, which depicts the idolizing behavior of teacher.

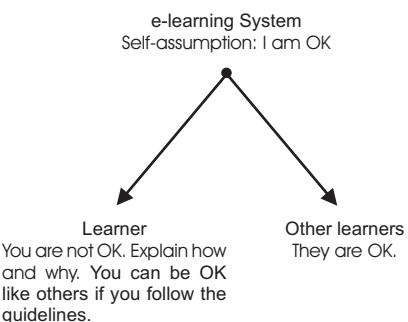


Figure 2.3: Idolizing behavior

Such behavior, which results in a comparison with others, is often not liked by the adult learners. Therefore it may be avoided while teaching to adult learners. The system can choose to idolize or not idolize depending upon whether the learner is in child ego-state or adult ego-state. It is often mandatory to fill up the profile details at the time of registering for the e-learning program. It is possible to derive the ego-state of learner based on the profile.

## 2.4. Scaring Behavior

This type of behavior is used to scare the learner by highlighting the bad effects resulting through particular actions. By presenting scaring visions, the teacher tries to drive the learners to do the right things.

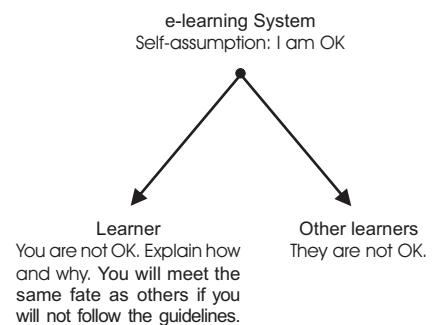


Figure 2.4: Scaring behavior

As per the cognitive or constructivist learning approach, the learner can experience the undesirable effects and build the knowledge required for avoiding them. At the same time, the system can consolidate the resulting realization by presenting the examples of other learners.

## 2.5. Polite Behavior

Alan Cooper (1995) has emphasized the need for designing polite software, but his paper does not provide the underlying principles required for designing the polite behavior. Without the transactional analysis, it is not possible to model the so-called friendliness or politeness. The model of polite behavior is illustrated in figure 2.5.

Usually, the teacher adapts polite behavior while dealing with adult learners. Indirect approach to pointing out the mistakes of adult learners helps in maintaining cordial relationship with them. Polite interaction between teacher (adult ego-state) and adult learner (adult ego-state) can produce positive results. If the e-learning system treats the adult learners as if they were in child ego-state, the learning process can be adversely affected.

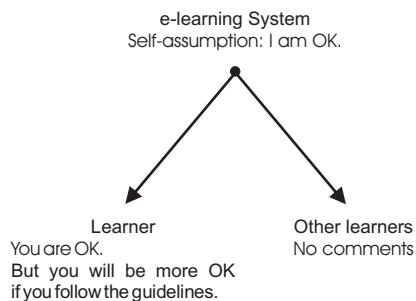


Figure 2.5: Polite behavior

In summary, our transactional analysis between teacher and learner has revealed 5 types of behavioral models, namely accusing, guiding, idolizing, scaring and polite behaviors. Out of these, the accusing behavior is not worth emulating, as it breaks the communication with learners. The guiding, idolizing, scaring and polite behaviors are worth incorporating in the design of e-learning systems.

## 3. Variable Factors

We have provided two different user interfaces to address the child and adult ego-states in the same version of Indian Scripts Typing Tutor. User interface is designed with two sets of metaphors and dialogs, which are tuned to

appeal the school children and adult users respectively. Aforesaid behaviors are incorporated in appropriate places.

Table 3.1 Variable factors

Variable factors	Adults	Children
Strictness	Flexible	Restrictive
Accountability	Less	More
Metaphor	Office cabin	Classroom
Color scheme	Conservative	Very colorful
Size of icons	Subdued, small	Loud and large
Dialogs	Polite, Guiding	Authoritative, Guiding, scaring Idolizing
Shapes of dialog pop ups	Rectangle, standard font	Semantic shapes and colors
Learning content	Serious, highly informative	Fun, simple and yet informative

### 3.1. Examples

Specific examples of variable factors in Indian Scripts Typing Tutor are presented below.

#### 3.1.1. Discipline

Indian Scripts Typing Tutor asks the adult learner whether (s)he would like to see the errors for improving the typing performance. On receiving their consent it presents the errors before them. Whereas, it directly presents the errors to children with an assertive instruction to improve the typing performance.

#### 3.1.2. Accountability

Indian Scripts Typing Tutor maintains the attendance record of learners. And insists on regularity in typing practice to children. Comparatively, it shows more flexibility to adult learners on this issue.

### 3.1.3. Interface Metaphor

As shown in figures 3.1 and 3.2 two different interface metaphors are selected to address the ego-states of school children and adult learners. Most evidently one can notice that the drawing area is represented as 'slate' for children and 'executive diary' for adult learners. Also the 'schoolbag' for saving the calligraphy is replaced by a 'folder' for adult learners. The demo area is like 'blackboard' in case of children but for adults it is like 'Pocket PC'.

### 3.1.4. Interface Color Schemes

Figures 3.1 and 3.2 show the distinct difference in the choice of color schemes for school children and adult learners.

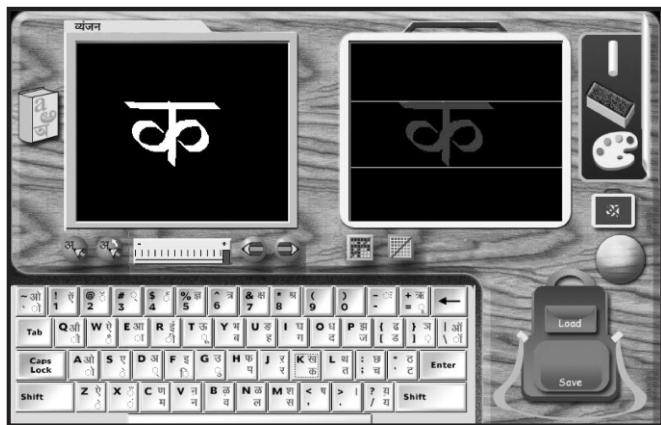


Figure 3.1: Classroom metaphor for school children



Figure 3.2: Office cabin metaphor for adult learners

### 3.1.5. Size of Icons

The icons are large in size and moderately rendered like real objects in case of 'classroom' metaphor. Whereas, the icons are very small in size and optimally rendered in case of 'office cabin' metaphor (Katre 2002).

### 3.1.6. Dialogs

Dialog box shown in figure 3.3 is rectangular in shape and the presentation of instructions is polite and passive. But the dialog box given in figure 3.4 has an interesting cloud like shape and it points out the mistake very directly to the school children. It asserts the instruction by presenting it in red color. Above examples corroborate with the polite and guiding behavioral models shown in figures 2.5 and 2.2 respectively.

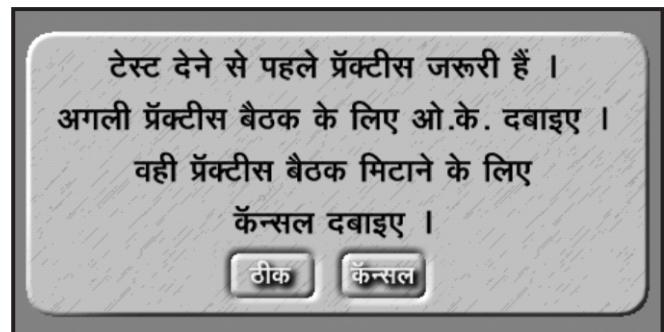


Figure 3.3: Dialog box for adult learners

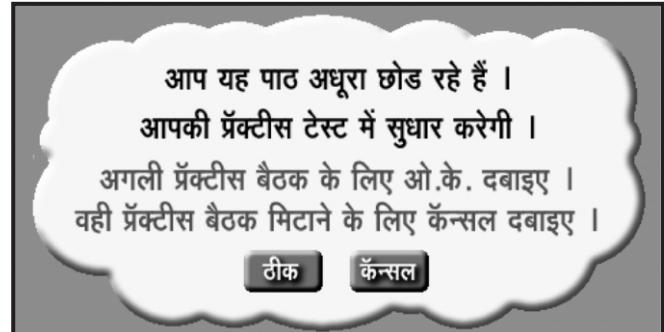


Figure 3.4: Dialog box for school children

### 3.1.7. Learning Content

The sample texts chosen for typing lessons are different for both types of learners. The existing vocabulary of school children and adult learners is considered while presenting

the complex, medium and simple words for typing practice. Stories and interesting poems are provided for the typing practice of children, whereas, the adult learners are provided with news reports, essays etc. for typing practice.

The learning instruction is being designed in terms of lessons, typing tips, guidance, and playful games. Evaluation of performance, certification, licensing scheme, network usage are the other aspects of this product that are being developed.

## 4. Conclusion

The transactional analysis of behavioral patterns between teacher and learner is useful in defining the behavior of e-learning systems. The study of ego-states of targeted learners can help in the selection of appropriate interface metaphors, color schemes and dialog design. The behavior of teacher can be represented in terms of interaction design, user interface design and the resultant emotional quality of experience. The aspects of e-teaching should be developed further to achieve e-learning. More research needs to be done to identify dynamic construction of instruction while incorporating the behavioral models identified in this paper.

## 5. Future Scope

Presently, the development of Indian Scripts Typing Tutor is on its way to completion. After its completion the usability tests will be conducted to evaluate the impact of behavior design. However, the usability tests conducted with the user interface prototypes have shown

encouraging results. We also propose to incorporate culture specific variations in the design of interface metaphors.

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### ABOUT THE AUTHOR

Dr. Dinesh S. Katre presently heads the National Multimedia Resource Centre of C-DAC, Pune, India. He has Ph.D. in Human Computer Interface (HCI). He has conceptualized and successfully implemented numerous sponsored R&D projects that deal with digital library for Indian heritage, low cost multimedia content creation, multimedia authoring, e-learning and 3D game development. He has special interest in navigation modeling, cross-cultural study of user interface, visual comprehension, interface metaphors and cognitive science of software users.

