Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2632907 A1 2007/04/19

(21) 2 632 907

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) Date de dépôt PCT/PCT Filing Date: 2006/10/13
(87) Date publication PCT/PCT Publication Date: 2007/04/19
(85) Entrée phase nationale/National Entry: 2008/04/11
(86) N° demande PCT/PCT Application No.: CN 2006/002700
(87) N° publication PCT/PCT Publication No.: 2007/041968
(30) Priorités/Priorities: 2005/10/13 (US60/725,859); 2006/08/10 (US11/501,974)

(51) Cl.Int./Int.Cl. *G06F 15/00* (2006.01)

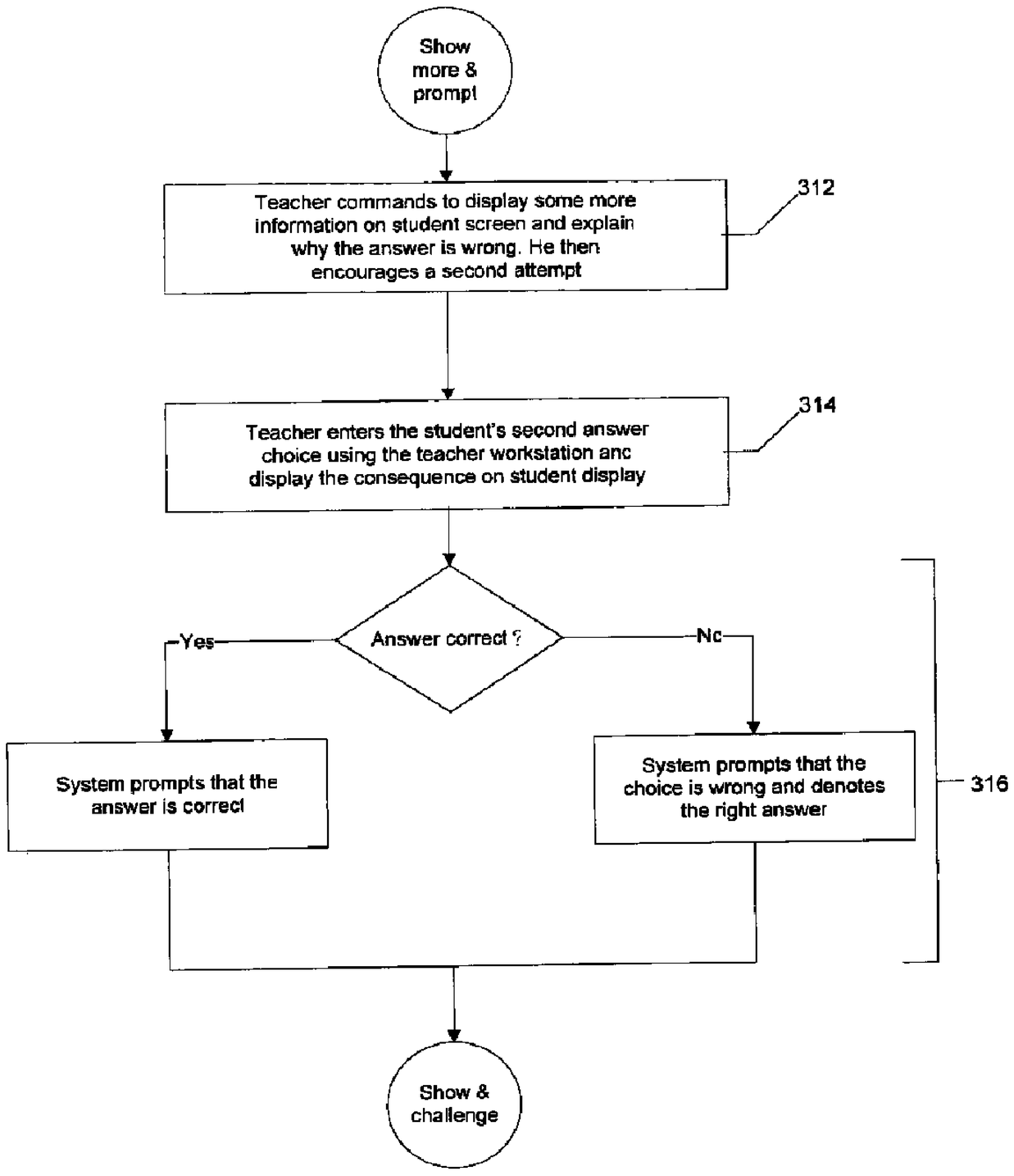
(71) Demandeur/Applicant:
HAU, KIT KING KITTY, CN

(72) Inventeurs/Inventors:
HAU, KIT KING KITTY, CN;
WA, SHI KIN HOWARD, CN;
WONG, YIN CHUNG NICHOLAS, CN

(74) Agent: MARKS & CLERK

(54) Titre : SYSTEME ET PROCEDE ASSISTES PAR ORDINATEUR POUR L'ENSEIGNEMENT ET L'APPRENTISSAGE GUIDES

(54) Title: COMPUTER-AIDED METHOD AND SYSTEM FOR GUIDED TEACHING AND LEARNING



(57) Abrégé/Abstract:
The present invention is a computer aided method and system for guided teaching and learning with the aid of an optional communication device, comprising the steps of: (a) presenting a question to the student at a student display; (b) receiving answer

CA 2632907 A1 2007/04/19

(21) 2 632 907

(13) A1

(57) Abrégé(suite)/Abstract(continued):
from the teacher at the teacher workstation, wherein the answer is received by the teacher from the student or directly from the students remotely; (c) sharing the answer submitted on at least one student displayed) determining whether the answer is correct; (e) presenting feedback to the answer at all student displays or workstations; (f) receiving input from the teacher at the teacher workstation for the teacher to give further information related to the question on student display; and (g) presenting information using a plurality of styles and stimuli corresponding to the input from the teacher or student on the student display.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
19 April 2007 (19.04.2007)

PCT

(10) International Publication Number
WO 2007/041968 A1

(51) International Patent Classification:
G06F 15/00 (2006.01)

(21) International Application Number:
PCT/CN2006/002700

(22) International Filing Date: 13 October 2006 (13.10.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/725,859	13 October 2005 (13.10.2005)	US
11/501,974	10 August 2006 (10.08.2006)	US

(71) Applicant and
(72) Inventor: **HAU, Kit, King, Kitty** [CN/CN]; 7A Gain Yu Bldg., 104 Warf Rd., North Point, Hong Kong SAR (CN).

(72) Inventors: **WA, Shi, Kin, Howard**; 2640 Po Tai House, Ching Tai Court, Tsing Yi, Hong Kong SAR (CN). **WONG, Yin, Chung, Nicholas**; 7A Gain Yu Bldg., 104 Warf Rd., North Point, Hong Kong SAR (CN).

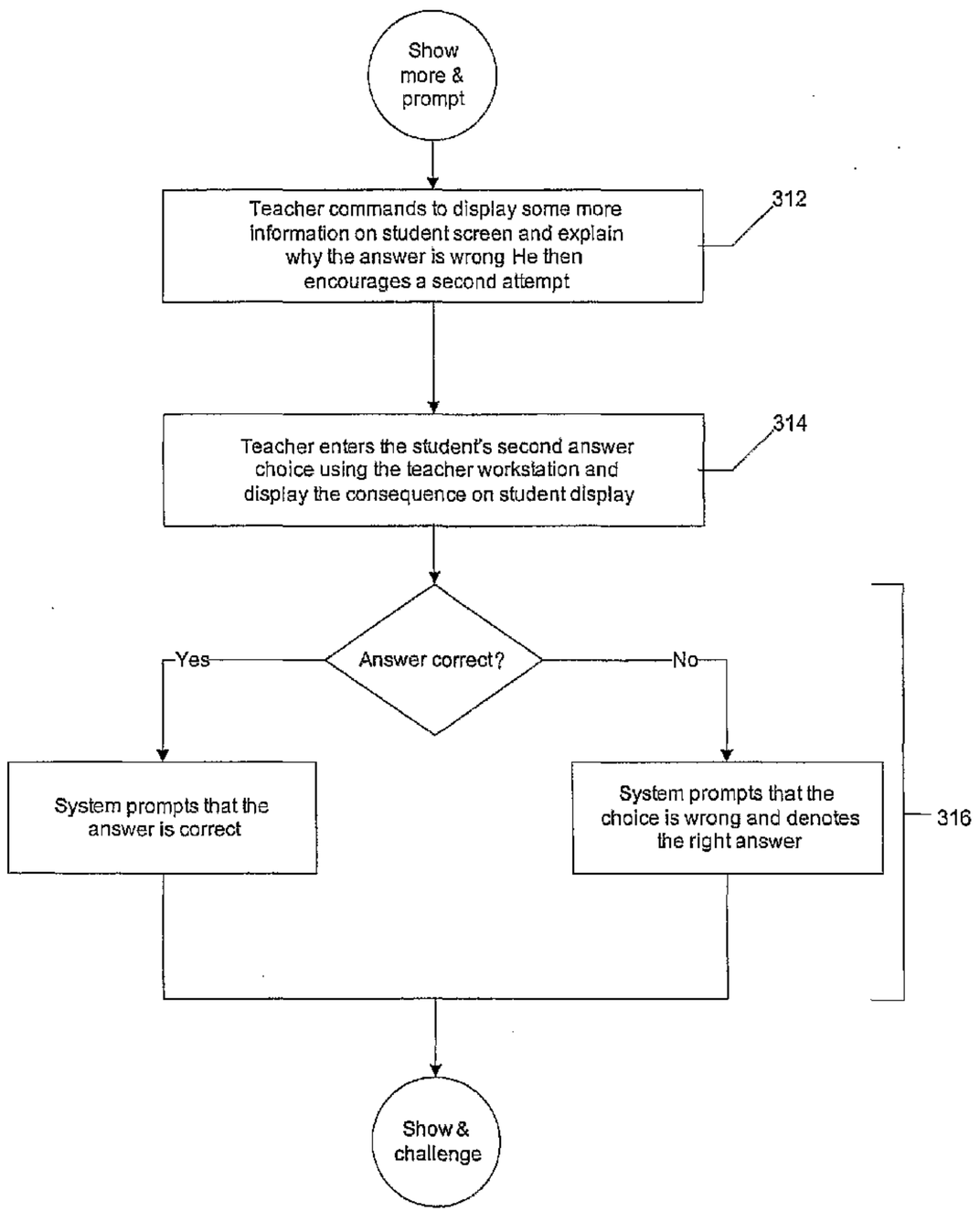
(74) Agent: **CHINA SINDA INTELLECTUAL PROPERTY LIMITED**; B11th Floor, Focus Place, 19 Financial Street, Xicheng District, Beijing 100032 (CN).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) **Title:** COMPUTER-AIDED METHOD AND SYSTEM FOR GUIDED TEACHING AND LEARNING



(57) Abstract: The present invention is a computer aided method and system for guided teaching and learning with the aid of an optional communication device, comprising the steps of: (a) presenting a question to the student at a student display; (b) receiving answer from the teacher at the teacher workstation, wherein the answer is received by the teacher from the student or directly from the students remotely; (c) sharing the answer submitted on at least one student displayed) determining whether the answer is correct; (e) presenting feedback to the answer at all student displays or workstations; (f) receiving input from the teacher at the teacher workstation for the teacher to give further information related to the question on student display; and (g) presenting information using a plurality of styles and stimuli corresponding to the input from the teacher or student on the student display.

WO 2007/041968 A1

WO 2007/041968 A1

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Computer-aided Method and System for Guided Teaching and Learning

Technical Field

The present invention relates generally to a computer-aided method for teaching and training, and a system to implement such method. In particular, the present invention relates to guided teaching in, for example, teaching a language to non-native speakers of the language, which combines the guidance of a teacher and the teaching materials presented in an interactive, audio-visual manner.

Background

As the new generation is exposed to using computer as a communication means, instant messaging software is popular among students as a communication outside the classroom. Students are also used to the audio-visual stimulation common in most video games. Many automated teaching systems adopting a computer game format have been created in order to replace the conventional classroom method and to make learning a more attractive and enjoyable experience to students.

In teaching language, for example, a teaching approach is for the student to do exercises related to the words to be taught. The student may be asked to give a definition of a word, fill a word in a blank part of a passage, or to identify a picture related to a specific word, while a number of answers are given for the student to choose from. There are existing software packed with graphics and sound effects using such approach to enhance learning effectiveness that may be able to arouse the students' interest in doing the exercise. However, the value of those software can be doubtful if appropriate guidance in reaching the correct answer sensibly is not provided, as the student who may simply make wild guesses and be frustrated by repeatedly failed attempts to arrive at the right answer, thus losing motivation to participate as a whole.

Obviously, the main disadvantage of such automated teaching method is that it lacks the human touch and the guidance from a teacher, which are the crucial elements that these products have thus far failed to capture from the conventional teaching method. The guidance of a teacher serves to guide the student back on the right track to think sensibly when a wrong answer is selected by leading the student through a brainstorming process, using additional data or hint that can assist the student to reach the correct answer in a sensible manner but not by wild guessing that very often is merely the effect of reflexive sense. Such discussion creates a bond between teacher and student and forms a friendly, appealing and interactive learning atmosphere which is only found in conventional classroom approach.

There are drawbacks however in conventional classroom approach that has to be refined using modern technology. The major one perhaps is the pre-requisite for the teacher to be very proficient in all aspects of the subject matter. Due to the complexity of some subjects such as language, it very often takes exhaustive training to groom high caliber teachers who shall have a strong grasp of grammar as well as the intuition for application of the language.

Hence, it makes sense to have a system that can equip the teacher with preloaded data and answer keys to support his teaching, with which the teacher is able to gradually pick up more knowledge about a particular subject matter as he uses the system to teach repeatedly along. That way, teacher can focus on playing the role as a facilitator to guide the students through an interactive learning process, and be released from the cumbersome task of digesting the details before giving the lesson.

Moreover, globalization has called for increased international communication. A few languages, such as English and Mandarin, are becoming more popularly used around the world, which in turn leads to an increase in the demand of language teachers to teach non-native speakers. A user-friendly teaching system is required to reduce the training period of the teachers. Undoubtedly, the value of a system with pre-loaded data is especially outstanding in situation where supply of experienced teachers or trainers is limited.

Another advantage of a preloaded database is that it can upkeep a curriculum systematically that can be then delivered in a method preset by the system, avoiding the subject matter and additional hint delivered by one teacher to deviate much from another. In addition, when a teacher departs or is absent, substitute teachers can readily assume his role using the same system loaded with teaching material to be delivered in manner already adapted by the students.

As it is rather time consuming to gather information and statistics on classroom experience for refining curriculum, a good system shall allow storing valuable information generated by teachers and students in the classroom for the purpose. In addition, flexibility for sharing the same among different teachers and students should be emphasized. The teacher himself may sometimes have much insight to offer in teaching a particular subject matter. The same situation applies to students too. In teaching vocabulary, for example, a student may have created a sentence to demonstrate the use of a word that is worth sharing with the students in other classes, on the other hand, may have misunderstood the usage of another word that can be applied as teaching material so that the other students can learn from sharing such mistake. One can imagine how many creative examples of vocabulary application and teaching ideas have gone down the drain due to the inability of educational systems to capture and share them amongst the teachers and students. In other words, an effective teaching system should not only restrict learning from the input of the teacher and the students in one class, but should also facilitate the sharing of such input in an larger scale, covering classes taking the same course within a school using the same LAN, or even other schools conducting classes using the same WAN.

There are difficulties though in sharing teaching content and method of teaching between classes that need to be addressed too - Due to also the effects of globalization and the impact of modern technologies, it is not uncommon nowadays for people of different cultural backgrounds and language abilities to learn under one roof or remotely apart. Therefore, there should be a system that can support cross cultural teaching and learning to allow students to learn together and progress at individual pace without affecting his peers too much.

Another essential feature needed of a system with preloaded curriculum is that it should be able to handle the large amount of input from different sources by identifying what should and should not be stored. There should be a resource effective component to ensure that the data so stored is of quality and that it is easily accessible to the users concerned.

No matter how well a teaching and learning process is designed and how experienced the teacher is in applying the process to teach, students may fail to perform the way they should in light of the many distractions facing them. Hence, a good system should be equipped with a control to appraise effectiveness and most importantly suggest remedial action accordingly.

To ensure teaching effectiveness, very often educators or trainers need to give extra support to the slower performers. There should be a system that allows and structures tutorial sessions to be carried out by a peer teacher or student taking the role of the original teacher in similar manner as the original lesson has been taught. Although the teacher may select manually the students he believes to be weaker in performance and those stronger ones to be the buddy teacher, it will spare the teacher from such cumbersome process if the system can also automatically identify student tutors, the participating students and most importantly, to structure the appropriate teaching contents to be used in the relevant extra tutorial session.

Last but not least, although in class face-to-face teaching is a preferred method of implementation, a good system shall acknowledge distant learning being a solution for educators and trainers in times of technical problems such as bad weather, war or wide spread epidemics etc. or where expertise about a particular subject matter cannot be made available simultaneously at different classrooms located apart. Therefore, the system should cater for different implementation methods, allowing at least one student and or one teacher/trainer leading a class of student(s)/trainees located remotely away from the more experienced teacher(s) to take part

The invention is a computer aided method and system that effectively apply information technologies to turn teaching and learning process into a fun-filled interactive logical guessing game, which can address the above educational problems by incorporating scientific education management methodologies into teaching and learning.

Summary of the Invention

The object of the present invention is to provide a computer-aided method for guided teaching, wherein teaching materials of various styles and stimuli are used.

In accordance with the present invention, there is provided a computer aided method for guided teaching and learning, using vocabulary as an example of subject matter. There are at least two methods of implementation. Implementation Method (1) for at least one teacher and one student within the same LAN, using at least one teacher workstation, with at least one student workstation, using at least one central processing unit, as well as an optional network or delivery device to support multimedia transmission of classroom discussions if needed. Implementation Method (2) for at least one teacher and one student or group of students on the WAN, using at least one central processing unit, as well as an optional network or communication to support multimedia transmission of classroom discussions if needed. The computer aided method and system comprising the steps of

In Implementation Method (1):

(a) presenting a question that is the subject item to the student at a student display;

(b) receiving answer from the teacher at the teacher workstation, wherein the answer is received by the teacher from the student or students in class;

(c) sharing the answer submitted on at least one student display;

(d) determining whether the answer is correct;

(e) presenting feedback to the answer at all student displays or workstations;

(f) receiving input from the teacher at the teacher workstation for the teacher to give further information related to the question on student display;

(g) presenting information sequentially and structurally using at least one of a plurality of styles and stimuli corresponding to the input from the teacher or student on the student display;

In Implementation Method (2):

(a) presenting a question that is the subject item at a teacher or student display;

(b) allowing the teacher(s) and student(s)located apart to communicate interactively using separate device(s);

(c) receiving answer from a remote teacher using a workstation whereas the answer is received by the remote teacher from the student or students in class; or receiving answer submitted directly by a remote student using a workstation;

(d) sharing the answer submitted by the remote teacher or student on other displays or workstations connected together on the same WAN;

(e) determining by the system whether the answer is correct;

(f) presenting feedback by the system instantly to the answer submitted at all remote displays or workstations;

(g) receiving input from the teacher at the teacher workstation for the teacher to give further information related to the question on student display;

(h) presenting information sequentially and structurally using at least one of a plurality of styles and stimuli corresponding to the input from the teacher or student on the student display;

The present invention provides significant advantages over the conventional teaching method, for example, the teacher may provide guidance to the student on the student display or on remote workstation connected to the teacher's workstation, using various styles and stimuli, such as text, sound, voice, audio, graphics, pictures, photographs, animation, comics or video, in a guided teaching approach. Such guidance is applicable in many teaching modes and is especially effective when the teacher uses multiple choice questions to interact with the students in the teaching process. The students will not be frustrated after selecting a wrong answer because the teacher, with the aid of the system, can guide the student to reach the correct answer afterwards.

In **one embodiment** of the present invention, after presenting the question to the student on the student display, the teacher may present additional information related to the question on the student display to guide the student to reach the right answer.

In **another embodiment** of the present invention, the teacher is provided, on his teacher display, with the necessary information for guiding the student(s) to learn, including the correct answer to the question he present to the student for teaching.

In **another embodiment** of the present invention, the additional information may be presented in a plurality of styles and stimuli, comprising: text, sound, voice, audio, graphics, pictures, photographs, animation, comics or video to arouse the interests of the student to learn.

In **another embodiment** of the present invention, the teacher may save and share teacher notes with other teachers on the same LAN or WAN.

In **another embodiment** of the present invention, the student may save and share notes with other workstations on the same LAN or WAN.

In **another embodiment** of the present invention, the teacher notes shared among teachers on the same LAN or WAN may be presented in a plurality of styles and stimuli, comprising: text, sound, voice, audio, graphics, pictures, photographs, animation, comics or video.

In **another embodiment** of the present invention, the student notes shared among teachers on the same LAN or WAN may be presented in a plurality of styles and stimuli, comprising: text, sound, voice, audio, graphics, pictures, photographs, animation, comics or video.

In **another embodiment** of the present invention, the system saves and shares notes submitted by teachers and students systematically.

In **another embodiment** of the present invention, the teacher is provided with a feature to retrieve flexibility the saved notes authorized to be shared.

In **another embodiment** of the present invention, a system is provided to ensure the teaching materials and hints delivered to the students by various teachers either located physically in the same class with the students or remotely away from the students are consistent.

In **another embodiment** of the present invention, the teacher may adjust the teaching materials pre-set in the system.

In **another embodiment** of the present invention, a system is provided to automatically formulate the level of difficulty of the questions and teaching mode applicable presented to the students according to the performance of the students.

In **another embodiment** of the present invention, the teacher is provided with a feature to dynamically re-formulate the level of difficulty of the questions and teaching mode at his discretion.

In **another embodiment** of the present invention, a system is provided to allow another person, for example, a replacement teacher or a student, to take up the role of the original teacher without much deviation from the original teaching style.

In **another embodiment** of the present invention, a system is provided to assign the appropriate students to conduct or to take extra tutorial session, whereby to appoint at least one students if needed who is qualified for taking the role of the teacher in the same manner as the original lesson has been conducted.

In **another embodiment** of the present invention, a system is provided to adaptively formulate the teaching content of the extra tutorial session based on the attendance record and performance of the students assigned to take the extra tutorial session.

In **another embodiment** of the present invention, a system is provided for the teacher to re-formulate the teaching content of the extra tutorial session based on the attendance record and performance of the students assigned to take the extra tutorial session.

In **another embodiment** of the present invention, the key information taken down by the system or provided by different teachers and students joining the same teaching process is recorded by the system for future review of the course materials.

In **another embodiment** of the present invention, the system provides extra means of communication to allow sharing of such interactive guided teaching and learning process with other remote venues simultaneously using a cascade remote network or other device(s) to support conference meeting between the teacher(s) and student(s).

In **another embodiment** of the present invention, the system identifies automatically the quality of the teacher and student notes and processes the notes to make it easily accessible to teachers and students.

Brief Description of Drawings

The above and other aspects, features, and advantages of the present invention will become more apparent upon consideration of the following detailed description of the preferred embodiments, taken in conjunction with the accompanying drawing figures, wherein:-

Fig. 1 is a flowchart which illustrates the log-in process in accordance with an embodiment of the present invention;

Fig. 2 is a flowchart which illustrates the retrieval of teaching materials in accordance with an embodiment of the present invention;

Figs. 3a - 3c are a set of flowcharts which illustrates the process of the guided teaching and learning method in accordance with an embodiment of the present invention;

Fig. 4a shows the screen capture on the teacher workstation in accordance with an embodiment of the present invention to illustrate teaching, controlling the display of data on student's display or workstations, capturing and sharing input from teachers and students, displaying more data or hints using different stimuli and extra language translation support, adjusting level of difficulty by the teachers dynamically.

Figs. 4b and 4c show the screen capture on the student display in accordance with an embodiment of the present invention;

In **another embodiment** of the present invention, the teacher is provided with a feature to dynamically formulate or re-formulate the level of difficulty of the questions and teaching mode at his discretion;

In **another embodiment** of the present invention, a system is provided to allow another person, for example, a replacement teacher or a student, to take up the role of the original teacher to teach using the pre-set material;

In **another embodiment** of the present invention, a system is provided to assign at least one student to conduct or to take extra tutorial session.

In **another embodiment** of the present invention, a system is provided to adaptively formulate the teaching content of the extra tutorial session for at least one student, based on the attendance record and performance of said student, in his individual practice, if any, who is assigned to take the extra tutorial session;

In **another embodiment** of the present invention, a system is provided for the teacher to formulate and re-formulate the teaching content of the extra tutorial session for at least one student based on the attendance record and performance of said student in his individual practice, who is assigned to take the extra tutorial session;

In **another embodiment** of the present invention, the key information taken down by the system or provided by different teachers and students joining the same teaching process is recorded by the system for future review of the course materials;

In **another embodiment** of the present invention, the system provides extra means of communication to allow sharing of such interactive guided teaching and learning process with at least one remote learning center simultaneously using a cascade remote network with device(s) to support conference meeting between at least one host teacher and one student;

In **another embodiment** of the present invention, a system is provided for using a plurality of languages to be used on the student display and for translation part of the teaching content including questions and information;

In **another embodiment** of the present invention, a student may re-select the language(s) used on his student workstation and for translating part of the teaching content including questions and information.

Brief Description of Drawings

The above and other aspects, features, and advantages of the present invention will become more apparent upon consideration of the following detailed description of the preferred embodiments, taken in conjunction with the accompanying drawing figures, wherein:

Fig. 1 is a flowchart illustrating the log-in process in accordance with an embodiment of the present invention;

Fig. 2 is a flowchart illustrating the retrieval and presentation of teaching materials in accordance with an embodiment of the present invention;

Figs. 3a - 3c are a set of flowcharts illustrating the process of the guided teaching and learning method in accordance with an embodiment of the present invention;

Fig. 4a shows the screen captured on the teacher workstation in accordance with an embodiment;

Figs. 4b and 4c show the screen captured on the student display in accordance with an embodiment of the present invention;

Fig. 4d shows the screen captured in accordance with an embodiment of the present invention illustrating how a teacher prepares in advance teaching note and pre-selects note authorized to be shared by other teachers and students for teaching.;

Fig. 4e shows the screen captured on the teacher or student workstation in accordance with an embodiment of the present invention illustrating a workstation used in distant learning;

Fig. 5a shows the screen captured on the teacher workstation in accordance with an embodiment of the present invention;

Fig. 5b and 5c show the screen capture on the student display in accordance with an embodiment of the present invention;

Fig. 5d shows the screen captured in accordance with an embodiment of the present invention to illustrating how the teacher prepares teaching note and pre-selects note authorized to be shared by other teachers and students for supporting teaching;

Fig. 5e shows the screen captured on the teacher or student workstation in accordance with an embodiment of the present invention illustrating a workstation used in distant learning;

Fig. 6 is a diagram illustrating a network arrangement in accordance with an embodiment of the present invention;

Fig. 7 is a flowchart illustrating an individual practice session in accordance with an embodiment of the present invention;

Fig. 8 shows the screen captured illustrating the recording of the score of a student or trainee in the individual practice sessions in accordance with an embodiment of the present invention;

Fig. 9 is a flowchart illustrating adaptive teaching in accordance with an embodiment of the present invention;

Fig 10 is a Remote teaching network diagram illustrating the method of implementation of the guided teaching and learning method on LAN in accordance with an embodiment of the present invention;

Fig 11 is a user interface of a panel on a teacher's screen showing video conference between at least one teacher and one student on LAN or WAN in accordance with an embodiment of the present invention ;

Fig 12 is a cascade remote teaching network diagram illustrating the method of implementation of the guided teaching and learning method on WAN in accordance with an embodiment of the present invention;

Fig 13 is a user interface of a panel on a teacher screen showing video conference between at least one host teacher, one remote teacher and one student on WAN in accordance with an embodiment of the present invention.

Detailed Description of the Invention

Log-in

As illustrated in Fig. 1 and 6, a preferred embodiment of the present invention allows host teacher to log-in **Fig.13 [450]**at a teacher workstation Fig. 4a and 5a [10] to record the teacher's attendance for a guided teaching session. The said teacher, as well as at least one remote teacher Fig. 13 [423] in a remote classroom, in the case of distant learning, may also log-in Fig. 4e and 5e as a student to represent the students who are present for the student attendance record. A remote teacher can guide his in class students to learn by handling submission of answer suggested by the student.

At least one individual remote student can also log in using also Fig. 4e and 5e with input means to submit data, for example, selection of answer and student note directly.

Once the host teacher and all remote workstations have completed login, the host teacher is provided with the option to trigger additional communication devices to support, for example, a video conference system, for remote interactive teaching and learning. The teacher workstation [10] Fig. 4a and 5a may, for example, be a notebook computer or a terminal, with a display device and a keyboard.

Where students learn by sharing a screen, a teacher may take a roll call manually and submit the attendance to the system. This step is needed when the students are not learning on individual workstations wherein the system is able to log and record automatically each student's attendance as soon as he logs in.

As illustrated in Fig. 2, in step [300], the teacher inputs the information related to the guided teaching session, for example, the grade, the class, the subject, as well as the lesson that can command the system to process teaching content [879] based on the key data (Please refer to Saving Key Data) stored in the profile Fig. 2 [878] to retrieve and load the relevant teaching mode and the pre-loaded teaching materials for guided teaching and learning.

The teaching mode defines the type of question used in the teaching and learning e.g. English, to be presented to the students. Some examples of the teaching mode are:

Teaching mode	Description of question type
LNI	Listen to the description and identify a related picture, video, picture, or other subject matters
LNW	Look at an object and write
MPC	Multiple choice
FIE	Fill in the essay

LMC	Listen to Mandarin or another language and choose an answer in English
FIB	Fill in the blank
TOF	True or false
LRW	Link the right word
RNW	Read and write
WIN	Arrange pictures, video or subject matters in a logical manner based on hints given
QNA	Question and answer
DIP	Definition of idiomatic phrase
PNV	Passage and vocabulary

Various teaching modes are provided so that the same set of materials used in teaching a language can be applied in different teaching modes according to the level of students as indicated from the key data stored in the profile Fig. 2 [878] and the desired outcome.

A preferred embodiment DIP mode

A preferred embodiment for teaching idiomatic English, also known as phrasal verbs in a guided teaching session, is used to illustrate the present invention. A phrasal verb contains a verb and a preposition, which carries a specific meaning only when the two parts are combined and used together.

Regardless of the subject matter and the teaching mode chosen, the guided teaching and learning session may be divided into the following major steps:

1. Show and ask;
2. Show more and prompt;
3. Show and challenge; and
4. Show and instruct

1. Show and ask

In a preferred embodiment, as illustrated in Fig. 3a in step [302], a question set [110] containing a set of question items and a number of answers [112a] for selection is displayed at the teacher workstation Fig. 4a [10]. The question set [110] is a number of question items being sentences each containing a phrasal verb and an appropriate preposition that can form the meaning that makes sense in the sentence. Each sentence, when presented on a student's workstation (Fig. 4b, 4c and 4e) will only show the verb with a following blank [126] for a student to insert an appropriate preposition, wherein the students are given a list of answers [112b] to select from.

In step [304], Fig. 3a, the host teacher selects a question item among the question set Fig. 4a [110] to work on and the system triggers the said question item to be presented on a student display Fig.4b [12]. By way of example, the question item [114a] is selected.

The student workstation Fig. 4b [12] may, for example, a screen for displaying to the whole class of students by a projector, or an individual workstation Fig. 5e with monitor and input means for each student.

Fig. 4b shows the student screen displaying the question item [114b] selected by the teacher and the list of answers [112b] available for selection.

As illustrating in Fig. 3a, step [306], the teacher discusses and interacts with the students until he has obtained one answer from a student to be entered. In Fig. 3a, in step [306], the teacher clicks on the answer [116] selected by the students on the teacher workstation Fig. 4a [10].

The answer [116] selected will be shown on the student display [12]. In this preferred embodiment, a line is connected from the relevant verb to the selected preposition [116] to denote the selected answer.

In Fig. 3a, step [310], a central server or processing unit [14] performs the comparison of the selected answer [116] with the correct answer. When the guided teaching and learning process is participated remotely by remote teacher(s) Fig. 13 [423] , the host teacher can use the enable submission button on his teacher screen [Fig. 4a] to select and allow one of the said remote teacher's learning centers to input by clicking an answer using [Fig. 5e] to the question presented on such student display, whereas the answer is collected by said remote teacher from his student(s)[411] in class. Meanwhile, an optional communication in the form of, for example, video conference serves to support interactive discussions between said host teacher and said remote teacher(s), who uses the talk request button [722] to lead in class students to join the guided teaching and learning session. In the same way, at least one individual remote teacher Fig.13 [430] and student Fig. 11 [can use the same screen 5e to submit inputs to the system for presenting to all other workstations on WAN directly whenever the host teacher allows his center to do so using also said enable submission button.

2. Show more and prompt

As illustrated in Fig. 3b[308], Fig. 4a, 4b and 4e, the system displays automatically a feedback triggered by the first selected answer on all the workstations , then, the host teacher may start a discussion and ask the student if the selected answer [116] is wrong, the host teacher may explain why the answer could be wrong to the students by giving further information [120] related to the question [114b]. The information [120] is provided to guide the students to have a second attempt to get to the correct answer, which can be in the form of various styles and stimuli, such as text, sound, voice, audio, graphics, pictures, photographs, comics, video, or a combination of the above, to make the teaching process more appealing to the students.

By way of example, the information [120] are the definitions of the phrasal verbs given in the list of answers [112b] in text form. The host teacher may select the phrasal verb of which the definition is to be shown using drop down box [136] at the teacher workstation [10].

The information [120] is shown in box [138] on the teacher workstation Fig. 4a [10]. The teacher may click Show button [140] to display the information [120] at the student display [12] in said student workstations. By way of example, the information [120] may also be provided in an audio form, that is, by executing an audio file containing the syllabus of the definition.

Such audio file may also contain a plurality of languages including a version in a common native language of the student(s) to enable the student(s) to understand the information [120] more easily. The teacher may present the definitions of some or all the phrasal verbs in the answers [112a] one by one by clicking to select on [136]. After learning the definitions of the phrasal verbs, the students can be able to get at the right answer more easily. The provision of the information [120] allows the students to make an educated selection to either submit the first answer using a submit button Fig. 4e or select a second answer, rather than making a wild guess.

As illustrated in Fig. 4c, in step [314], a host teacher leads a brainstorming discussion with the students directly or through the said remote teacher to obtain a second answer [122] from the students and input the said second answer at the teacher workstation Fig. 4a[10] or Fig.5e remotely. The student display [12] shows the answer [122] selected that triggers interactively the feedback 'wrong' [124]. as well as the correct answer [126] as illustrated in Fig.3b in step [316] on all workstations.

3. Show and challenge

As illustrated in Figs. 3c in step [318] and [320], 4a and 4c, after the system displaying the correct answer [126the host teacher may trigger to review his or other teachers' teaching note [128] with respect to the question set [110], saved Fig. 5d (Please refer to Review before class) stored in the central server or processing unit [14] by selecting a level indicator [133] using pull down list [130] in Fig. 4a. The teaching note [128] may be examples created by the teacher (see Review before class below) or used by other teachers to illustrate the correct answer [126]. The teaching note [128] are grouped with respect to each specific question set and are automatically assigned a level indicator [133] on the level of difficulty according to the class for which the teacher has saved the teaching notes [128] for using teacher screen 4d. By clicking the "Display" button [141], the teaching note [128] stored in the system may be shown at the student display [12] Fig. 4c and 4e.

The host teacher may also create his own teaching note [128] in class in box [129] and show the teaching note [128] at all the student displays [12] above by clicking the Show button [132]. The teaching notes [128] will be saved for future reference. The teacher may save the teaching note [128] without showing on the student display [12] by clicking the Save button [134]. If the teacher wants

to make the teaching note [128] available for sharing with other teachers, he may click the Share button [137] to create an instruction to the server to authorize the sharing.

In Fig. 3c in step [320], the host teacher challenges and guides the students to create their own sentences using the phrasal verb taught in the question [114a]. The host teacher, or host teacher may enter the sentences [144] in Fig. 4a and in Fig. 4e respectively created by the students as reference note in box [146]. The host teacher may click a enable submission as shown on Fig. 5e to allow the remote teacher to present the note by clicking a submit button as shown on Fig. 4e below the list of answers [112].

In Fig. 3c in step [322], the host teacher may discuss with the students about the created sentence [144] and give his comments. If a created sentence [144] is a good example of the use of the phrasal verb, the teacher may save the sentence for future use by clicking the button Fig. 4a [148]. If the created sentence [144] seems to be a common error made by many students, the teacher may save the sentence for future teaching purpose. If the host teacher wants to make the sentences [144] available for other teachers, he may click the Share button Fig. 4a [151] to instruct the server to authorize the sharing too.

4. Show and instruct

After the 'Show and Challenge' Process, the host teacher may proceed to the next question by repeating from step [304]. In the course of teaching, the host teacher may provide instructions to the students on homework assignments. As illustrated in Fig. 3c in step [324], the teacher may enter in class or trigger to present on all workstations an instruction (which he has stored in the server as he 'Review before Class' for the relevant guided teaching and learning session using Fig. 5d), using Fig. 4a [152] in box [154] at the teacher workstation [10]. The host teacher may also click the Show button to show the instructions [152] on the student display [12], save it and make it available for sharing with other teachers using buttons [142] and [169].

Review before class

As shown in teacher screen Fig. 4d, the teacher may preview the teaching material, for example the question set [110] and the answers [112] for selection before conducting the teaching session. The teacher can therefore become acquainted with the teaching materials before class.

The teacher may also create some examples of sentences or other stimuli to describe or illustrate the correct answer. Such examples or stimuli may be saved as teaching note [128] in box [129] by clicking Save button [134] for the teacher's own retrieval or by clicking Share button [137] for sharing with other teachers. The teaching note [128] are saved with respect to each question set and are assigned dynamically a level indicator [133] according to the level of the class the teaching note [128] has been created for. The system processes and assigns the level by using the key data such as the individual performance of a student or the average performance recorded in each student's' individual practices.

The teacher may also select and review the teaching note [128] of other teachers by using the level indicator [133] at box [130] for searching. The teacher may pre-select the teaching note [128] or stimuli of the teachers to be shown in the class by checking the box [131]. The pre-selected teaching note or stimuli may be recalled by the host teacher in class during the guided teaching process by clicking Display button [141] as shown in Fig. 4a.

He may also select and review the note created by students in the 'Show and Challenge' process, which the teacher(s) have saved using his teacher workstation in class, to use as part of the teaching content.

In order to facilitate the teacher in shuffling and viewing the saved teaching noteor stimuli created by teachers and students, the central server or processing unit [14] may keep track of the number of times a teaching note or stimuli has been selected to show to the students, and automatically delete the note below a pre-determined selection rate in a period of time.

The teacher may also save some instructions [152] to be presented in class to students by inputting in box [154] and clicking the Save button [142]. He may also instruct the system to allow sharing of the instructions with other teachers by clicking Share button [169].

Another embodiment: FIB mode

In addition to the above embodiment for teaching phrasal verbs, the present invention is also applicable in other teaching mode. In another preferred embodiment for teaching vocabulary, the present invention is used in providing fill-in-the-blank questions using the FIB mode. The students are given a selection of words or vocabulary, which usually carry clear meanings by themselves. The host teacher is allowed to provide additional hint or information to the students for reaching the correct answer.

As illustrated in Fig. 5a and 5b, a host teacher may click button "Show/Hide"[202] to trigger the system to present the question at a box [204] on the student display [12]. The teacher may also click button "Play"[206] to play a pre-recorded audio form of the question pre-loaded in the system. A list of answers containing one correct answer is provided in box [208] on the student workstations 5b, 5c and 5e, screen [12] for selection.. The host teacher may enter an answer in the blank in [204], which is collected from the students. A feedback triggered by the first answer entered is presented on the student screen Fig. 5b and Fig. 5e [220] to indicate if the first answer is correct. He may further clicks the Play and Show extra material button to display more data on the student workstation in Fig. 5b, 5c, and 5e [600] to show additional information on the student display [12] which will assist the students in reaching the correct answer.

By way of example, the feedback may be the definition of a word listed in box [208] or other stimuli related that can guide the students to think and choose sensibly. The" The 'Show and Prompt', 'Show and Challenge' Process as described in the embodiment in the DIP mode above can be applied in similar manner using this mode, whereas remote teacher(s) and student(s) can also join

the guided teaching and learning also. Should the teacher choose to disclose the correct answer to the students who have failed in the first attempt s, he can click the button "Play and Show"[212] to display the answer [210] on the student display [12] at anytime at his discretion, he can also trigger extra material or text in other language [297] to display on [298] so as to make the student(s) understand the meaning of a word more easily.

In Fig 5d. The teacher may review the teaching notes and stimuli of other teachers or to input his own teaching note or stimuli in box [221a] before class. The teacher may enter his teaching note or stimuli to be shown on the student display [12] by clicking the Save button [260]. The teacher may authorize the sharing of his teaching note or stimuli with other teachers by clicking the Share button [262]. Further, a box [222] is provided for displaying and selecting the examples provided by other students and a box [224] is provided for entering instructions for the students, for example, to do homework assignment that the teacher can also share with other teachers by clicking Share button [333].

Multi-lingual display

The system is able to pre-select the language of the student display [12] according to the need of the students stored in the student's profile Fig. 2 [878], whereas the teacher, by selecting a language in box [219] on Fig 5a, can re-formulate the language used. By way of example, Chinese is used as the default language of the student display [12], which also means that the student concerned would like to use Chinese as a plurality of extra languages to translate the subject matter, including the questions, so that it is easier for him to understand the meaning of it.

There may be a mix of students from different countries joining the same lesson in class. Each student may prefer to have their own student display [12] in his own language. In another preferred embodiment as shown in Fig 5e, Distant Learning Screen, each remote teacher leading a remote class or each student learning individually from home, may be provided with a student display [12] with input device to submit data to the host teacher. The teacher or student may reset the selected language to display or translate part of the teaching content including the questions, using pull down list [219] on his workstation in case he wants to choose to learn a second language as he learns English along.

Key data or details regarding students taking part in the guided teaching and learning will be stored in the system using a user profile, which includes the extra language translation the relevant student will like to use as extra material [600] on Fig 5e to help the student to learn more easily. The student can re-select his choice of language on his student display using pull down list [219] on 5e.

Editing materials

In this preferred embodiment, a host teacher may easily edit the teaching material, such as the question, the supplementary information and the teaching note or stimuli before class. As illustrated in Fig. 2, in step [301], the said teacher may retrieve the teaching material for editing. He may edit the questions or prepare his own teaching note using a teaching workstation Fig. 5d. The teacher may edit the question in box [250] and

click button "Edit base note" [252] to save the amendment. The teacher may also edit the supplementary information in box [254] and click button "Edit base note"" [256] to save the amendment. The host teacher may prepare the teaching note or stimuli in box [258] and save the same by clicking Save button [260]. The teacher may further authorize the sharing of his teaching noteor stimuli with other teachers by clicking the Share button [262]. He may formulates or re-formulates the level of difficulty of the teaching note assigned by the system according to the key data (Please refer to the Saving Key Data below) including the performance of a student or a class of students in individual practices recorded in the student's profile. By clicking the level button [293] on 5d and [133] on 4d, the teacher can find it easier for him to search for the type of teacher note or stimuli with level of difficulty most suitable for his own students.

Networking

As illustrated in Fig. 6, the teacher workstation [10] and the student displays [12] are connected to the processing unit [14], which may be, for example, a personal computer or a sever of the school. The server of the school may be connected to other computers [16], for example, in a student computer laboratory, or in the teacher office. The teachers and the students may also use their own computers [18] at home to access the central server or processing unit [14] via the Internet.

There are two ways of implementation of the guided teaching and learning process, Method (1) and Method (2). The central server or processing unit [14] of a school may be connected with the central server or processing unit [14] of another school to share the teaching materials. A global server [20] may contain the most updated software patch and teaching materials. The school central server or processing units [14] may be connected to the global server [20] for regular downloading of the updated software patch and teaching materials.

The server [14] of a school storing the data and system is controlled by the host teacher workstation to handle sharing of data amongst workstations.

Method (1) – Computer Aided Method for Teaching and Learning in class on LAN (RTN)

Each student either has a workstation, or shares a common display with the class using a projector. The teacher teaches using the same guided teaching method. The teacher screen will be similar to, for example, Fig. 4a and 5a. The student screen will be similar to, for example, Fig 4b and 4c as well as 5b and 5c. The teacher can use a workstation similar to a student's screen 4e and 5e to input answer or submit note in class on behalf of a student or class of students suggesting answer as a group.

Method (2) – Computer Aided Method for Teaching and Learning in class on WAN using the concept of Cascade Remote Teaching Network (CRTN)

For guided teaching and learning method conducted remotely, each Remote Teaching Network (RTN) can support up to as many students as

physically feasible in a remote classroom or training venue. In the event that there are more students than the venue can accommodate, new RTN groups can be created. These new RTN groups can be cascaded to the main RTN network in a pyramid structure (Fig. 12 and 13). The host or head teacher communicate or interacts with the RTN group teachers or student learning individually from home via the Video Conference Monitor using his own workstation (Fig.4e and 5e). Each RTN group teacher interacts with his/her group of students similar to RTN in Method (1). The Cascade Remote Teaching Network (CRTN) group teachers act as relays of the host or head teacher as well as other guest teachers [430] and [411] in Fig 13 to present the teaching materials to the students in his own locale.

While the communication network is based on Internet, the connectivity for each student to the network may include DSL, cable modem, T1, satellite, wireless or whatever means available at the geographic locale of the student(s) concerned.

Video Conference Monitor

The key to a successful remote learning experience is the additional communication device - All the remote participating venues are equipped with communication device(s), for example, a web camera, a headphone and loud speakers etc. to support Video Conference by connecting to the same main server through the Internet. [Fig 10, 11, 12, and 13] joining the guided teaching and learning process.

The host teacher's workstation has the sole right to command the server to allow other workstations to communicate with his workstation by sending text, graphic, pictures, audio or video signals using the enable submission button on Fig. 4a and 5a, such that he can provide guided teaching remotely. By clicking [722] Talk Request or [373] Talk on Fig. 4e and 5e, the enabled workstation is then able to submit input including audio video signals to the server that processes and presents the same to all workstations on WAN. When the communication system is triggered, the image of, for example, a remote teacher or student will show up in the display panel in 372 on a student screen similar to Fig. 5e as illustrated in Fig. 11. The host teacher will be able to trigger a panel showing also the image of the person enabled to communicate with him by triggering a hidden panel on his host teacher screen.

Individual practice session

In addition to classroom teaching, the students may be requested to do homework assignment by taking individual practice session for re-enforcement. In an individual practice session, by way of example as illustrated in Fig. 7, each student is given questions related to the teaching materials arranged in the way as in a guided teaching and learning session. The students may access the questions in a computer laboratory in school or at home by connecting to the school server [14] in Fig. 6 via the Internet.

As illustrated in Fig. 8, the scores of the students are recorded by the central server or processing unit [14] in Fig.6. By way of example, the student receives 1 score for each correct answer. The average score of all the students in the class therefore serves as an indicator on how familiar the class is with the teaching materials. Such performance of student in individual practice will be used by the system to assign students to involve

in tutorial session and assign level of difficulties of the teaching content as discussed in the above teaching modes.

Adaptive teaching

In a preferred embodiment as illustrated in Fig. 9, in step [400], the school server [14] records key data including language preference and the scores of the students in individual practice sessions. The school server [14] then suggests the level of difficulty to be adopted for the guided teaching session, the individual practice session and the tutorial session (which will be further described below) in Fig. 9 step [402], according to a pre-determined table matching the average score to the level of difficulty. The teacher may re-adjust the level of difficulty using [273] as shown in Fig. 4a and [230] as shown in Fig. 5a.

By way of example, in providing fill-in-the-blank questions as illustrated in Fig. 5b, the level of difficulty in providing fill-in-the-blank questions in a guided teaching session may be formulated by increasing or reducing the number of answers provided in box [208] in Fig. 5b. The more answers available to the students for selection, the more words the students need to know of the meaning before they can get at the right answer. As such, the level of difficulty increases with the number of answers for selection. The system can automatically generate the number of answers for selection according to the average score of the students in the individual practice session. The teacher may further adjust the number of answers if necessary according to the response of the students in class by using the pull down list Fig. 5a [230] and Fig. 4a [273]. That way, the current invention enables students of different levels to learn under the same roof and progress at their own pace is fulfilled.

Tutorial session

Some students may be required to take extra tutorial session to be conducted by a more advanced student in the class. The advanced student may take the role of the teacher to host a guided teaching session for his classmates using the present invention. The students who need to take the extra tutorial session may be those who have skipped a guided teaching and learning session or those who have scored low in the individual practice session. In another preferred embodiment, the central server or processing unit [14] may assign at least one student to conduct and at least one student to take the extra tutorial session according to the attendance record of the student and their score recorded in the individual practice session. The teacher may preset a practice score and an attendance level to be the benchmark for a student to be qualified to represent a teacher to host a tutorial session or to be required to take the tutorial session. The central server or processing unit [14] may match the score of a student in said student's individual practice session and the attendance record to the benchmark score and attendance level or frequency to suggest to the teacher the students who are qualified to be a teacher in the tutorial session or who need to take the tutorial session. In addition, the system can automatically structure the appropriate teaching content based on the participating student' scores and behavior as shown in his attendance record.

Saving key data

The central server or processing unit [14] will save the key data in the course of the guided teaching session, such as, for example, the attendance of each student in the guided teaching session, the time required for the students to correctly answer a question in the guided learning session, the data such as language preference in the number of times the host teacher gives additional information on the student display to guide the a student to reach the correct answer and the number of wrong answers made before reaching the correct answer. Such data may be used to review and design better teaching materials, such as, for example, the questions, answers, note and additional information to make teaching more effective. The system can also save and store the performance of a student in each individual practice score in the student's profile Fig. 2 [878], where the student's language used is also stored.

Database structure

The following databases are used as part of the method and system of the present invention.

Table 1

Login Table

Name	Description
LogInID	Unique ID for login
UserName	User Name for login
Password	Password
UserType	Type of users (Teacher / Admin / Students…etc)
WorkstationID	Unique ID of the workstation joining the learning process

Table 1 holds the information for login. When a user login as illustrated in Fig. 1, he will select the user type and input his username and password. The system will then obtain the login ID from the Login Table and check whether the user is authorized to login. If the login is successful, the system will load the corresponding screen according to the user type. The system will at the same time retrieve the component for video conferencing wherever necessary to support remote teaching and learning interactively.

Table 2

Lessons Table

Name	Description
LessonID	Unique ID for lesson
ModeID	Unique ID for teaching mode
ClassID	Unique ID for class
Level OfDifficulty	Level of difficulty

Each lesson contains the teaching materials of the guided teaching system or the tutorial session, for example, the questions, the answers for selection, the additional information in various styles and stimuli, such as text, sound, voice, audio, graphics, pictures, photographs, animation, comics, or video. Table 2 holds a list of the Lesson ID.

After the teacher has input the required information and the lesson number in Fig. 2, the system will select the relevant Lesson ID from the Lessons Table and load the corresponding teaching materials to the teacher workstation 10, and the student display 12 according to the level of difficulty & the teaching mode applicable, which are determined by the system automatically through analysis of student performance and learning behavior.

Table 3

Mode Table

Name	Description
ModeID	Unique ID for teaching mode
Name	Name of teaching mode
Description	Description of teaching mode

Table 3 stores a list of the teaching mode. This table relates the teaching mode such as FIB, MPC, TOF and LRW and the description of the teaching mode to the Mode ID.

Table 4

LessonItem Table

Name	Description
LessonItemID	Unique ID for lesson Item
LessonID	Unique ID for lesson

Each Lesson Item contains the teaching materials of each question. Table 4 contains the Lesson Item ID and the Lesson ID. After selecting a Lesson by the teacher, the system will select the relevant Lesson Item ID from the LessonItem Table and load the corresponding teaching materials to the teacher workstation 10, and the student display 12 according to the Lesson Item ID.

Table 5

Phrase Table

Name	Description
Phrase ID	Unique ID for the phrase
Phrase	The question phrase
Audio	Audio file of the phrase
Definition	Definition of the phrase

DefinitionAudio	Audio file of the definition of the phrase
Example	Example of the phrase
ExampleAudio	Audio file of the example of the phrase

Table 5 contains phrases to be listed in box 112A on teacher workstation 10 in Fig. 4a and box 112B on student display 12 in Fig. 4b as well as examples of application 110 reflected on teacher workstation 10 in Fig. 4a which are to be displayed one by one 114B on the student display 12 in Fig. 4b. Each example of application can be combined with the relevant idiomatic phrase, which is the lesson item to be taught, from 112 on student display 12 to form a meaningful statement 126. There is also a list of definitions to illustrate the meaning of the idiomatic phrases. Each phrase is loaded according to the phrase ID.

Table 6

Vocabulary Table

Name	Description
VocabID	Unique ID for vocabulary
Vocab	Vocabulary
Definition	Definition of vocabulary
DefinitionAudio	Definition of vocabulary in audio format
Example	Example of the application of the vocabulary
ExampleAudio	Audio file of the example of the application
Answer	Answer of the example
Extra Language	Translation Meaning of the vocabulary in another language

Table 6 contains the vocabulary, which may be the answers for selection in a question. The vocabulary is to be combined with the definition of vocabulary, extra language translations and the data from other tables such as the digital file etc. to form a complete question set. The audio recording of the pronunciation of the vocabulary, its example of the application, audio of the example of the application, and the answer of the example and extra language translation are also included in this table.

Table 7

Digital File Table

Name	Description
DigitalFileID	Unique ID for digital file
Type	Type of the digital file
FilePath	Retrieval path of the digital file
Description	Description related to the digital file

Table 7 contains the ID for identifying the digital file related to each question. The digital file can be in the format of video, image or audio. The digital file combines the data from other tables, such as the Phrase and the vocabulary, which may be the answers for selection, to form a complete question. This table also contains the type, the

retrieval path and the description of the digital file, where type indicates the type of the digital file.

Table 8

Classes Table

Name	Description
ClassID	Unique ID for class
SubjectID	Unique ID for subject
ClassName	Name of class
Term	Term number
SchoolYear	School Year

Table 8 contains the information of each class. The system may retrieve the name of the class, subject to be taught, the term, the school year and other information of each class by the Class ID.

Table 9

Student Table

Name	Description
StudentID	Unique ID for student
ClassName	Name of class
PersonalID	Personal ID for student
FirstName	First name of student
MiddleName	Middle name of student
LastName	Last name of student
ExtraLanguage	The type of extra language preferred

Table 9 contains the information of the students. The system may retrieve the information of the student, such as, the name of class, the student personal ID number, the first name, middle name and last name and the preferred extra language of the student by the Student ID. The additional language that used in translating the main object of learning e.g. vocabulary and phrasal verb, of the student display for selection may be set according to the nationality or personal profile of the student.

Table 10

Student Test Summary Log Table for the Individual Practice Session

Name	Description
SummaryLogID	Unique ID for the Student Test Summary Log
StudentID	Unique ID for student
TestID	Unique ID of the Test
Score	Score of the Test
Remarks	Remark for the Test Summary Log
Correct	Number of correctly answered questions in a test
Wrong	Number of wrongly answered questions in a test

Table 10 contains the students' test results in the Individual Practice Sessions. The table contains the score, the number of correctly and wrongly answered questions, and the remarks of the test. The score will be referred to in nominating the level of difficulty of questions for adaptive teaching, and in selecting the students to participate in the Tutorial Session. The teacher uses the data in combination of his in-class experience to dynamically re-adjust the level of difficulty of questions. The test results may be retrieved by the Student ID.

Table 11

Teacher Table

Name	Description
Teacher ID	Unique ID for teacher
PersonalID	Personal ID for teacher
FirstName	First name of teacher
MiddleName	Middle name of teacher
LastName	Last name of teacher
Employment Date	Date of employment

Table 11 contains the information of the teachers. The system may retrieve the information of the teachers, such as, the personal ID number, the first name, middle name and last name of the teacher, as well as the date the teacher was employed to teach by the Teacher ID.

Table 12

Teaching Notes Table

Name	Description
NoteID	Unique ID for the teaching notes
ContentType	Type of teaching content of the teaching notes
Content ID	Unique ID of the ContentType
TeacherID	Unique ID of the teacher to identify the author
Date	The creation date of the teaching notes
UsageCount	Number of times the teaching notes has been used
Note	Content of the teaching notes
Note Level	Level of difficulty or grade level of the Teaching notes
IsShared	Flag used to identify note authorized to be shared

Table 12 contains the information of the teaching notes. The system may retrieve the content of the teaching notes, content type, level of difficulty, author, creation date and usage count by the NoteID. Besides that, the system will base on the flag named "IsShared" to denote the teacher note that can be retrieved for sharing. The Date and UsageCount keep track of the number of times the teaching notes have been selected for

teaching, and the teaching notes below a predetermined selection rate in a period of time will be automatically deleted.

Table 13

Class Memo Table

Name	Description
ClassMemoID	Unique ID for the class memo
LessonID	Unique ID of the Lesson
TeacherID	Unique ID of the teacher to identify the author
Date	The creation date of the class memo
Memo	Content of the class memo
IsShared	Flag used to identify class memo authorized to be shared.

Table 13 contains the information of the class memo. The system may retrieve the content of the class memo, its date of creation, lesson and author by ClassMemoID. In addition, the system will base on the flag named "IsShared" to denote the class memo that can be retrieved for sharing.

Table 14

Student Memo Table

Name	Description
StudentMemoID	Unique ID for the student memo
LessonID	Unique ID of the Lesson
StudentID	Unique ID of the student to identify the author
Date	The creation date of the student memo
Memo	Content of the Student memo
IsShared	Flag used to identify student memo authorized to be shared

Table 14 contains the information of the student memo which will be used as a student note. The system may retrieve the content of the student memo, its date of creation, lesson and author by StudentMemoID. In addition, the system will base on the flag named "IsShared" to denote the student note that can be retrievable for sharing.

Table 15

ModeLevel Table

Name	Description
ModelLevelID	Unique ID for the ModeLevel
Level	Level of difficulty of the teaching mode
Description	Description on the content of the teaching mode

Table 15 contains the information of the level of difficulty of the teaching mode. The system may retrieve level of difficulty of the teaching mode and its related content by ModeLevelID.

Table 16

RollCall Table

Name	Description
LessonID	Unique ID for Lesson
StudentID	Unique ID for Student
Date	Date on taking roll call

Table 16 contains information of student's attendance in guided learning process. The table contains LessonID, StudentID and Date. If the student login to join a lesson, his attendance will be recorded in this table. For in class learning where the teacher controls the student workstation to input on the student's behalf, the teacher shall use Fig. 8 to take a roll call to record a student's attendance in the record by using 801 in Fig. 5a.

Table 17

Student Test Summary Log Detail Table for the Individual Practice Session

Name	Description
SummaryDetailLogID	Unique ID for the Student Test Summary Log Detail
SummaryLogID	Unique ID for the Student Test Summary Log
QuestionStartTime	Start Time for presenting the question
QuestionFinishAnswerTime	Time for receiving the correct answer of the question
AttemptNumber	Total Number of attempt prior to reaching the right answer
isSeekHelpCount	A flag to label the right answer produced by system upon student's request

Table 17 contains the detailed information of the student's test result recorded in the Individual Practice Sessions. The table contains the SummaryLogID, QuestionStartTime, QuestionFinishAnswerTime, and AttemptNumber. In this table, SummaryLogID is used for identifying the user to whom the summary log belongs to, QuestionStartTime and QuestionFinishAnswerTime help compute the time needed for a student or a combined class takes to get to the right answer. AttemptNumber is used to record down the total number of attempt prior to reaching the right answer and times the system needs to produce a right answer at student's request. The system can base on the data stored in this table to evaluate the performance of the student.

Table 18

Test

Name	Description
TestID	Unique ID for the Test
TestQuestion	Question of the Test
RightAnswer	Right Answer of the Test

Table 18 contains the information of the practice or test. Each record being stored in this table represents a particular question of a practice or test. This table contains TestID, TestQuestion and RightAnswer, where the system will retrieve questions from this table and use them in the Individual Practice Sessions. In here, test is actually equal to part of the practice where practice is the simplified guided learning.

There are also databases containing other information, for example, the instructions to the students, the examples from the students to be used in quiz or test, the common error made by the students for teaching purpose and future reference, and the object of learning (e.g. vocabulary and phrasal verb) in other languages, which are used in the guided teaching session as described in the disclosed embodiments.

In addition to be used in class teaching, the present invention is also applicable in one-to-one teaching and long distance learning via the Internet. The present invention is not limited to teaching in school, but is also applicable to training in various aspects.

While the invention has been described in detail with reference to disclosed embodiments, various modifications within the scope of the invention will be apparent to those of ordinary skill in this technological field. It is to be appreciated that features described with respect to one embodiment typically may be applied to other embodiments.

What is claimed is:

1. A computer-aided method for guided teaching and learning between at least one host teacher and at least one student having at least one teacher workstation, at least one student workstation with display, and at least one central server which can be on LAN or on WAN, and at least one optional video conference system supported by devices, comprising the steps of:

(a) presenting a question to the student at said student display;

(b) receiving an answer at said teacher workstation, wherein said answer is suggested by a student in class or directly from the first student or a teaching on behalf of a student using a workstation at a remote location;

(c) sharing the answer submitted on all workstations;

(d) determining whether said answer is correct;

(e) presenting a feedback to said answer on all workstations, where the feedback is triggered dynamically by the answer;

(f) allowing for the first or another student to decide if he wants to submit another answer;

(g) allowing the teacher or student to input a second submission;

(h) sharing the input submitted to each student display;

(i) receiving input from the teacher to trigger further information related to said question on all workstations;

(j) presenting information sequentially, interactively and structurally using at least one of a plurality of styles and stimuli corresponding to the input from the teacher or student on all workstations.

Wherein said central server is connected to said teacher workstation and said student workstation with display, such that the teacher, with the aid of the system and the pre-loaded information and feedback triggered by wrong answers, provides guidance to at least one student on said student workstation in a guided teaching session.

2 The computer-aided method as recited in claim 1, wherein said plurality of styles and stimuli comprises: text, sound, voice, audio, graphics, pictures, photographs, animation, comics and video.

3 The computer-aided method as recited in claim 1, wherein said question comprises a plurality of answers for selection.

4 The computer-aided method as recited in claim 1, further comprising the step of receiving input of information including note that may be a second plurality of styles and stimuli comprising: text, sound, voice, audio, graphics, pictures, photographs, animation, comics and video by the teacher at said teacher workstation or by the student directly on a remote workstation.

5 The computer-aided method as recited in claim 4, further comprising the step of presenting said note on said student workstation.

6 The computer-aided method as recited in claim 4, further comprising the step of receiving an instruction from the teacher on the authorization for presenting said note at said student workstation and controlling the presenting of said note according to said instruction.

7 The computer-aided method as recited in claim 4, further comprising the step of storing said note in a central server.

8 The computer-aided method as recited in claim 7, further comprising the step(s) of receiving an instruction from the teacher on the authorization for sharing said note by at least one teacher workstation and controlling the sharing of said note according to said instruction.

9 The computer-aided method as recited in claim 8, wherein said central server processes the said note to make it easier for the teacher to access the note most suitable for his student(s).

10 The computer-aided method as recited in claim 7, wherein a level indicator is assigned to said note for identifying a level of the student applicable to said note during retrieval.

11 The computer-aided method as recited in claim 1 wherein the student is engaged in an individual practice session after the guided teaching session and a performance of the student in said individual practice session is recorded by the said central server.

12 The computer-aided method as recited in claim 1, wherein said central server stores an attendance record of the student in said guided teaching session.

13 The computer-aided method as recited in claim 11, wherein central server formulates the level of difficulties of the said question and information including note used in

the guided teaching session based on said performance of said student in said individual practice session if available.

14 The computer-aided method as recited in claim 1, wherein said central server, allows the teacher to formulate and re-formulate the level of difficulties of the said question and information including note when the said practice score is unavailable.

15 The computer-aided method as recited in claim 14, wherein at least one student is selected by said central server to engage or take the role of a teacher in a tutorial session using teaching material structured by the system based on the performance of the student in his individual practice session.

16 The computer-aided method as recited in claim 15, wherein at least one student is selected by said central server to engage in a tutorial session using teaching material structured by the system based on the attendance record of the said student in a guided teaching session.

17 The computer-aided method as recited in claim 1, wherein said central server records key data including the student performance in individual practice for future revision of said question and information that is part of the teaching material, comprising at least one of:

- duration of time between presenting said question and receiving said correct answer ;
- the number of said input from the student between presenting said question and receiving the correct answer from the student;
- the number of right answers interactively displayed and triggered by wrong answers submitted.

18 The computer-aided method as recited in claim 1, wherein said question and information including note can be edited by at least one teacher.

19 The computer-aided method as recited in claim 4, wherein said note comprises at least one of:

- an idea from the teacher related to said question;
- an illustrative example related to said question;
- an idea from the student related to said question ;
- an illustrative example from the student related to said question; and

- an instruction from the teacher to the student.

20 The computer-aided method as recited in claim 1, wherein one of a plurality of languages can be selected automatically by the system to be used on a student display and for translation of questions and information, according to the requirement of the student as stored in said student's personal profile in the central server.

21 The computer-aided method as recited in claim 1, further comprising at least one student input device for receiving input from the student to re-select the language to be used on said student workstation.

22 A computer-aided system for guided teaching and learning between at least one teacher and at least one student on LAN or WAN comprising:-

- a server having processing means for sharing input of data interactively between all workstations joining said guided teaching and learning session;

- a server having memory means for storing a series of questions with a list of answers to be presented to said student;

- at least one teacher workstation associated with said central server for processing and presenting all necessary teaching material including question and information from a series of question with a list of answers for guided teaching and learning;

- at least one student workstation with display associated with said central server for presenting a question from the said series of question with a list of answers to said student;

- at least one teacher workstation associated with said central server, having input means for receiving input from the teacher to give information related to said question and associated answer from the teacher, wherein said answer is suggested by the student;

- at least one student workstation with display associated with said central server for with input means for submitting input related to the said question by the student remotely;

- at least one teacher workstation having input means for receiving an input from the teacher or remote student to trigger a feedback related to the answer;

- at least one communication means between said server, said teacher workstation and said and said student workstation and between at least one optional communication system to support guided teaching and learning remotely;

- wherein said central server can be connected to said teacher workstation(s) and said student display via a LAN or WAN through the internet;

- wherein said system can be used in combination of an optional communication system using the concept of cascade remote teaching networks, such that the teacher provides guidance to the student(s) on said student display with the support of the communication that support audio video signal transmission on WAN;

- wherein said server having processing mean to determine whether said student answer is correct and said student display displays a feedback triggered to said answer; such that the teacher provides guidance to the student on said student display;

- wherein said system can be used in combination of at least two optional communication devices using the concept of cascade remote teaching networks, such that at least one teacher provides guidance to at least one student on said student workstation on LAN or WAN;

- wherein said central server having processing means to trigger a feedback to said answer on all workstations connected, such that the teacher, with the aid of the system and said information and feedback, provides guidance to the student on said workstation on LAN or WAN with the aid of at least two communication devices.

23 The computer aided system as recited in claim 22, wherein said central server having processing means to trigger dynamically information in a plurality of stimuli, comprising: text, sound, voice, audio, graphics, pictures, photographs, animation, comics and video, which is related to the right answer of the question and shares the same on all workstations.

24 The computer-aided system as recited in claim 22, wherein said input means is capable of receiving input of note from the teacher and student.

25 The computer-aided system as recited in claim 24, wherein a central server stores and presents said note to other teachers and students.

- instruction from the teacher to the student.

37. The computer-aided method as recited in claim 12, wherein said central processing unit, allows the teacher to re-formulate the said question;

38. The computer-aided system as recited in claim 33, wherein said central processing unit formulates the said question or subject matter in the extra tutorial session based on the score and attendance record of the students in the individual practice sessions, who are nominated to take such extra tutorial session.

39. The computer-aided method as recited in claim 9, wherein said central processing unit processes the said notes to make them more easily for the teachers to access the notes most suitable for their student(s).

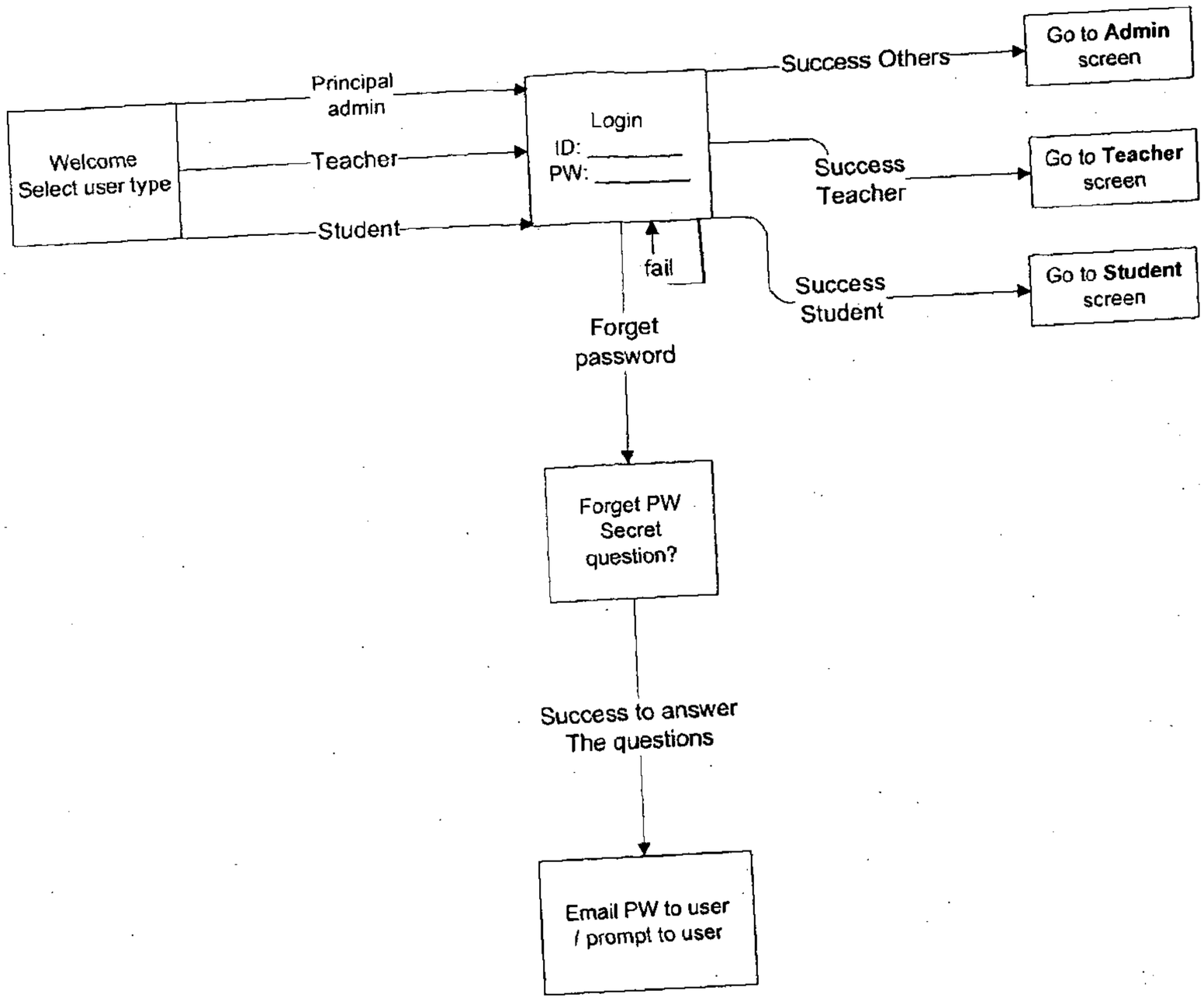


Fig 1

13 · AUG 2007 (13 · 08 · 2007)

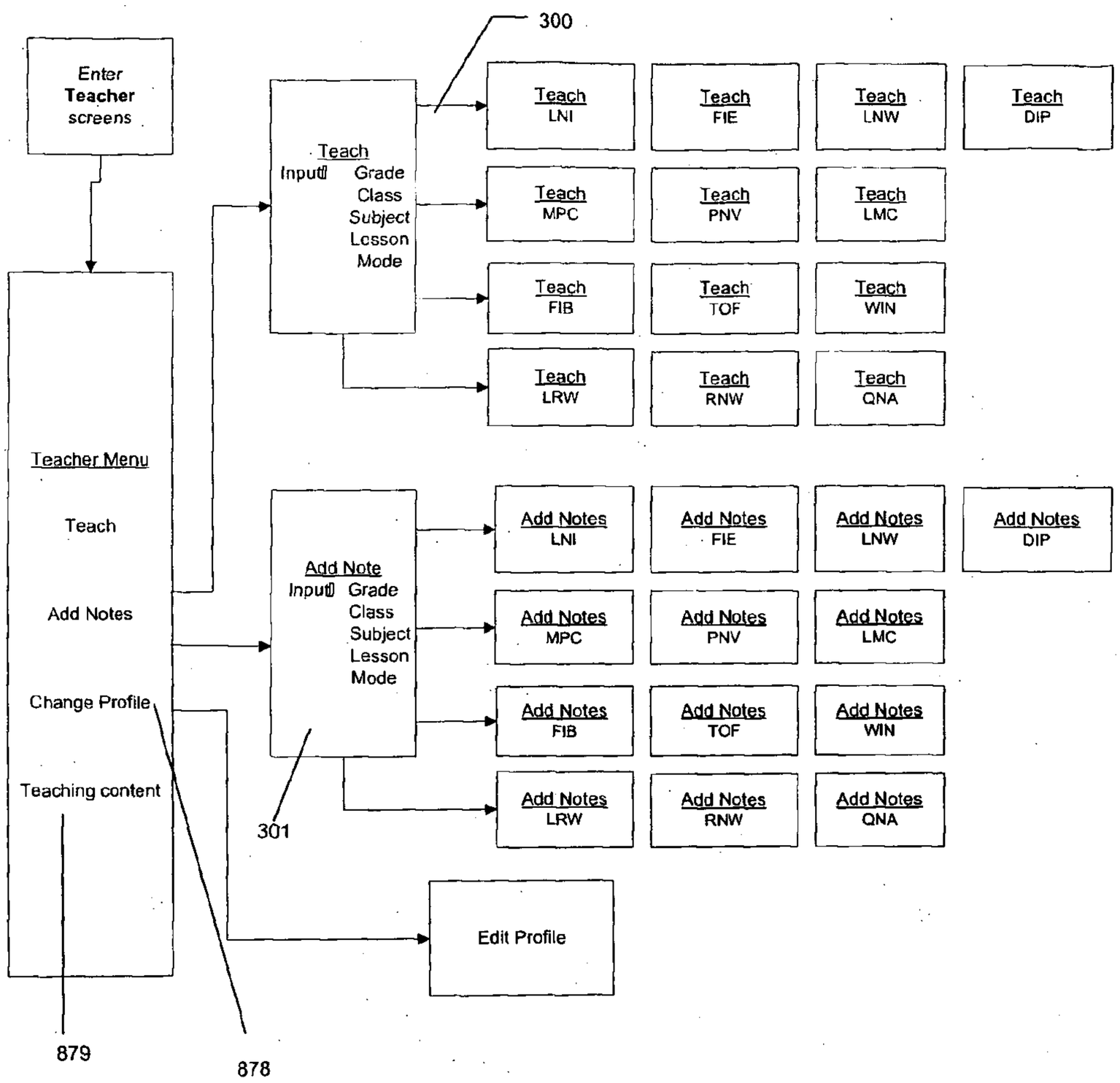


Fig 2

修改页:PEA/CN

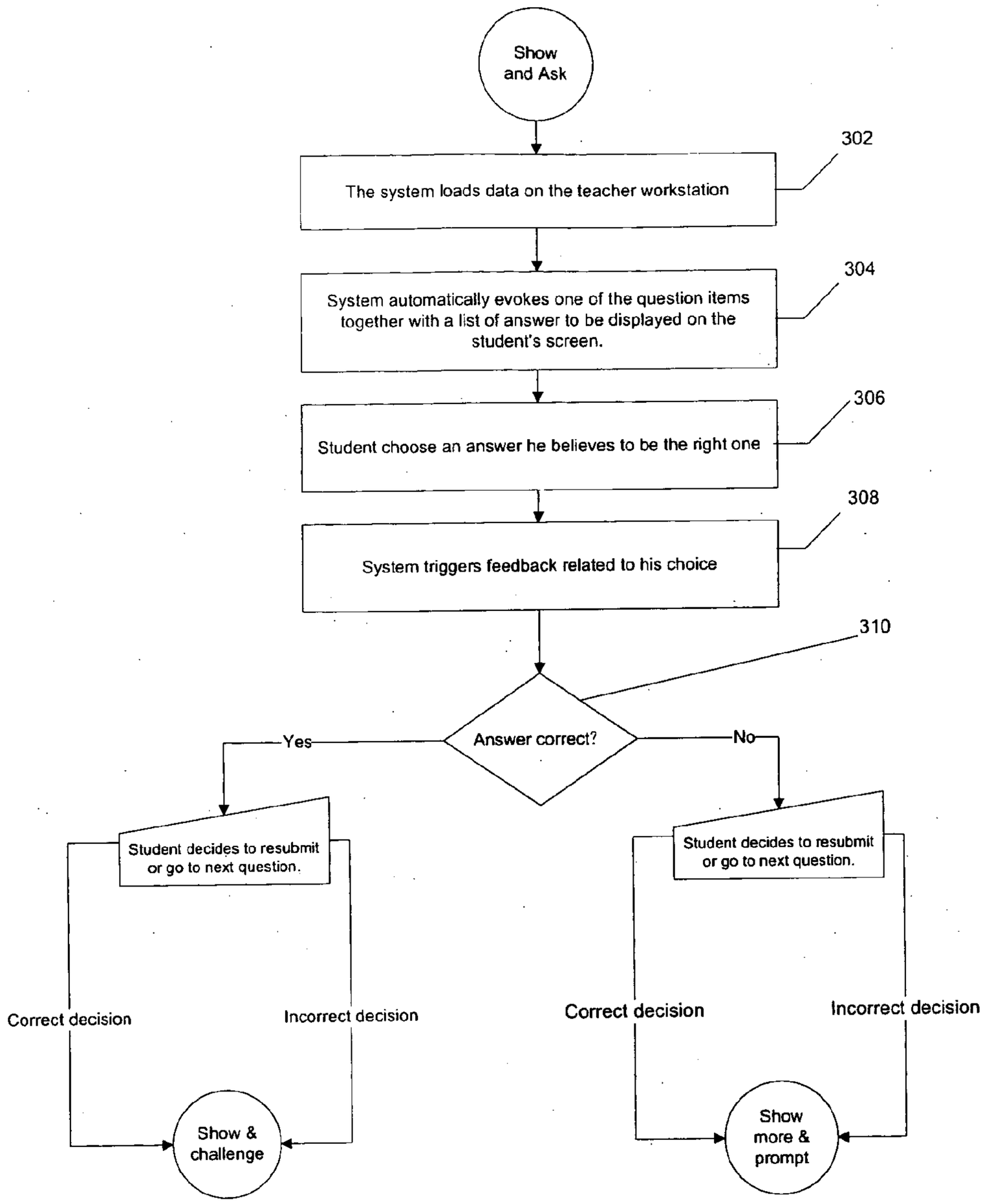


Fig 3a

13 AUG 2007 (13-08-2007)

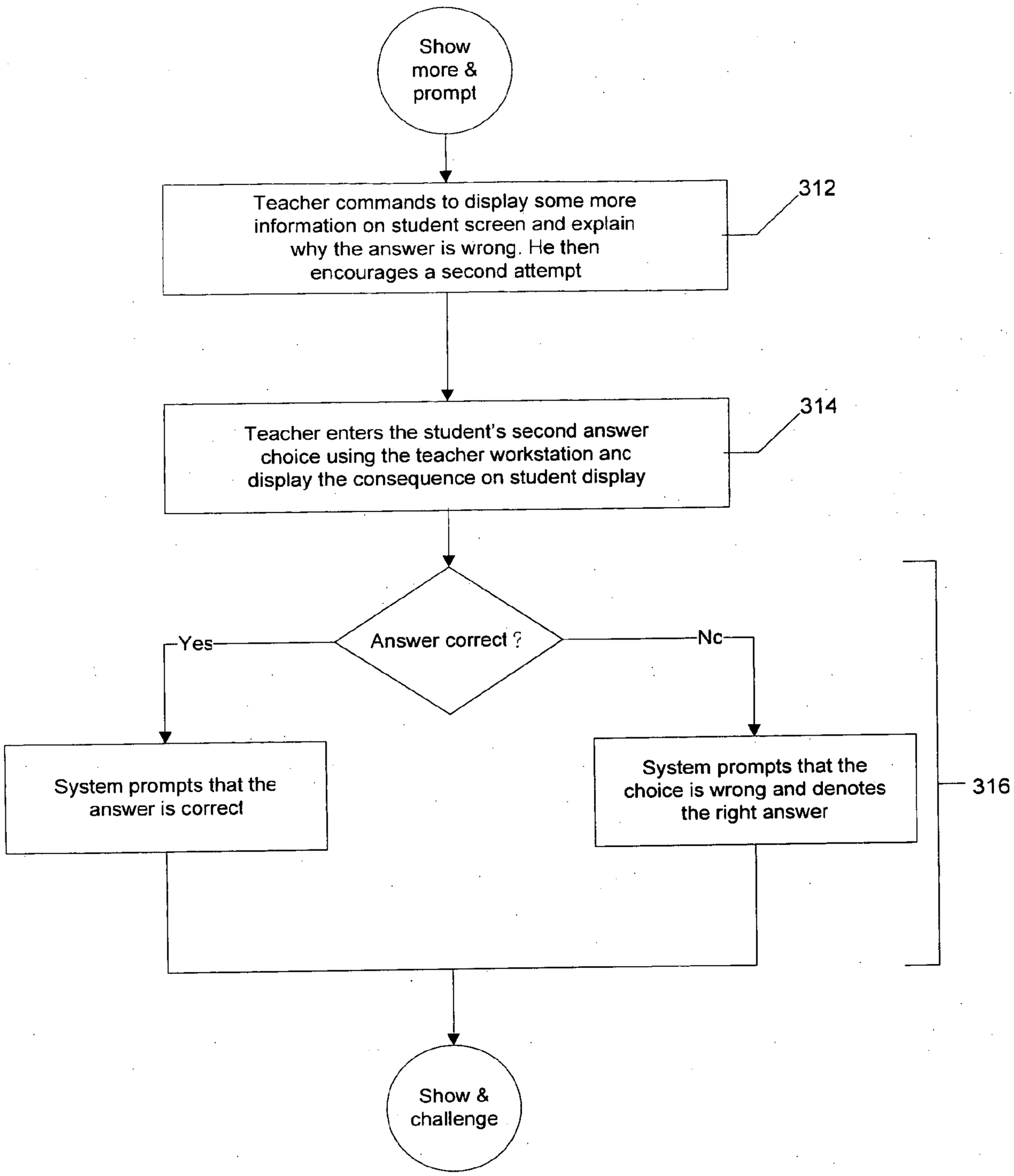


Fig 3b

修改页:PEA/CN

13 · AUG 2007 (13 · 08 · 2007)

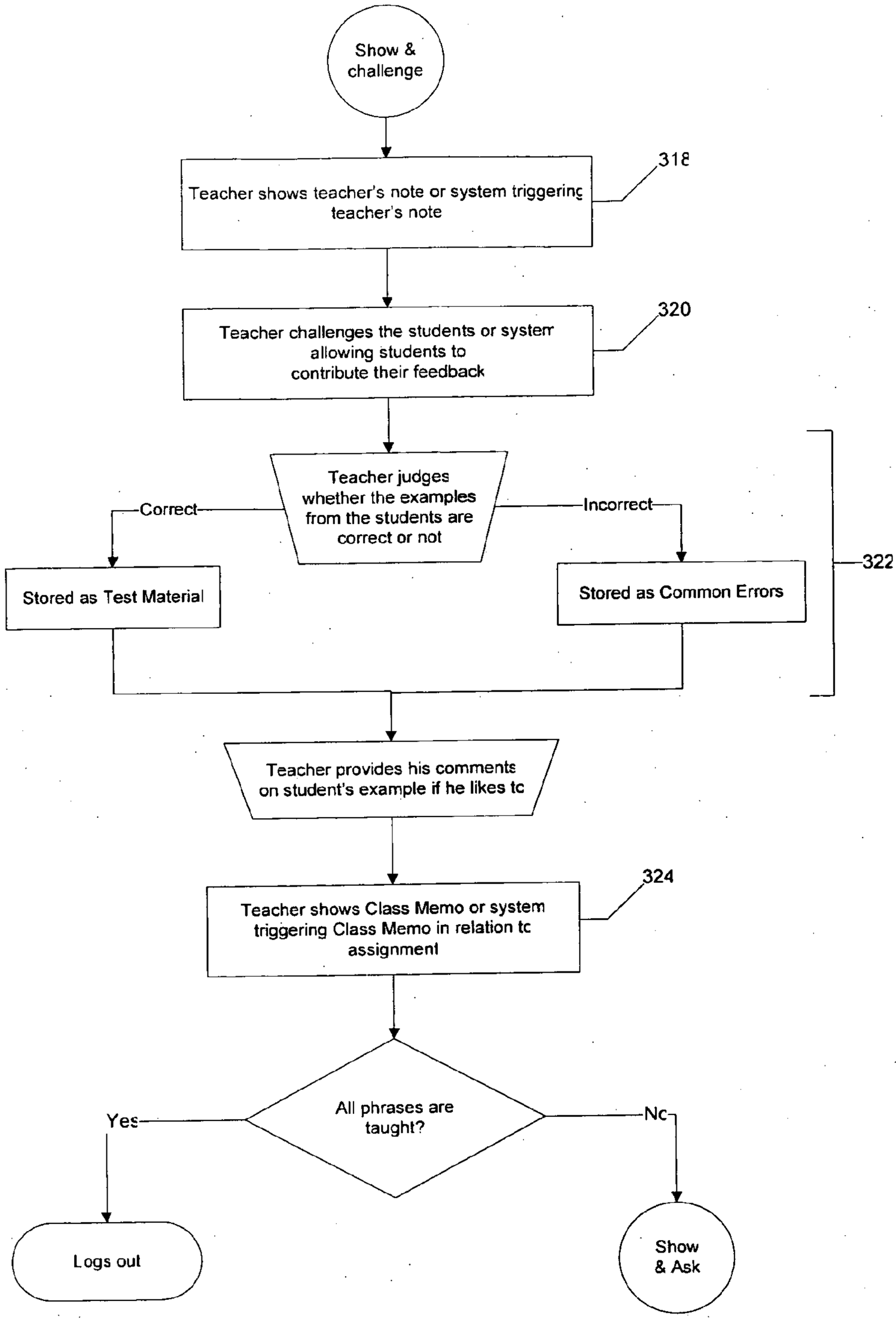


Fig 3c

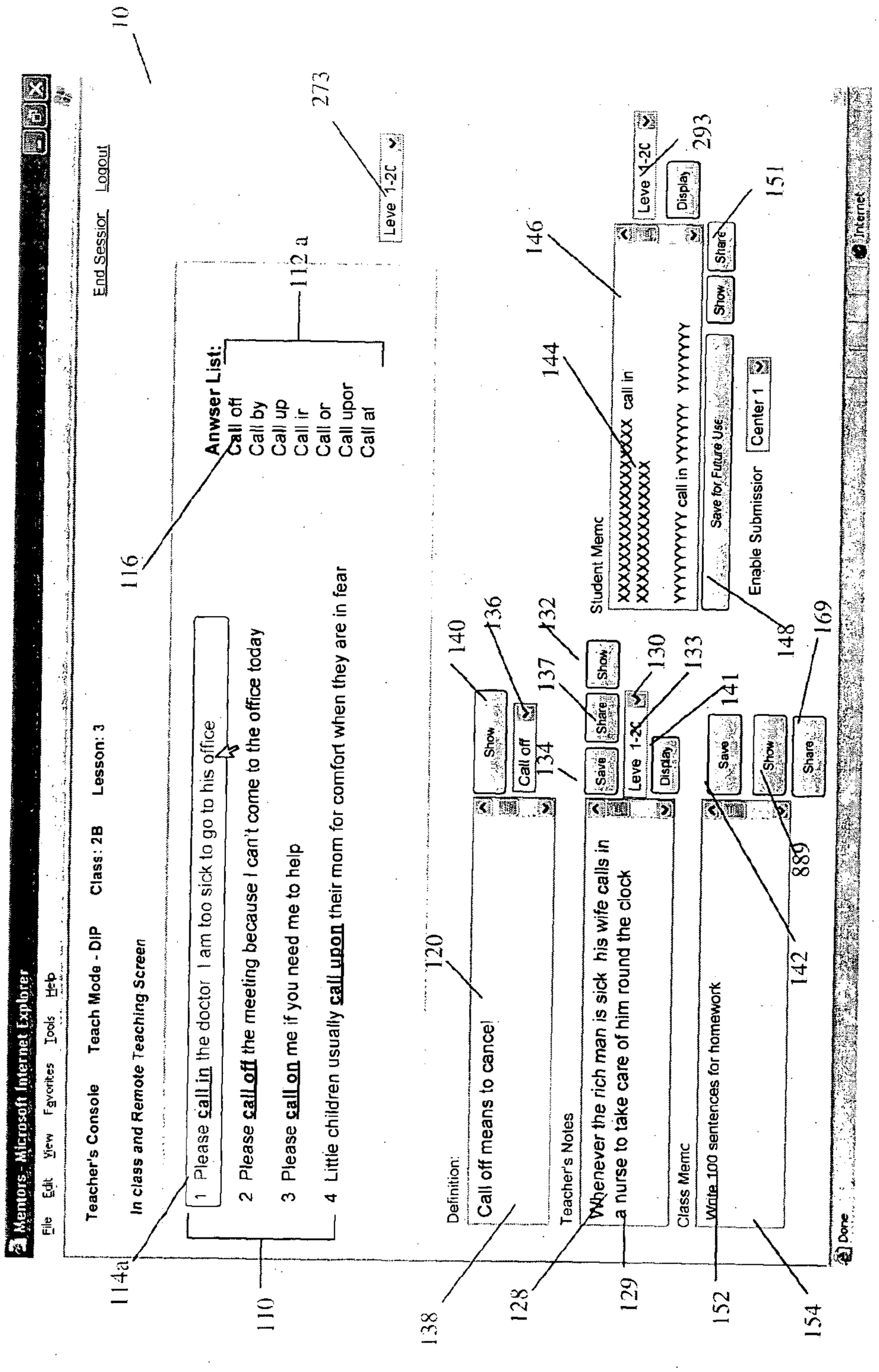


Fig 4a

修改页:PEA/CN

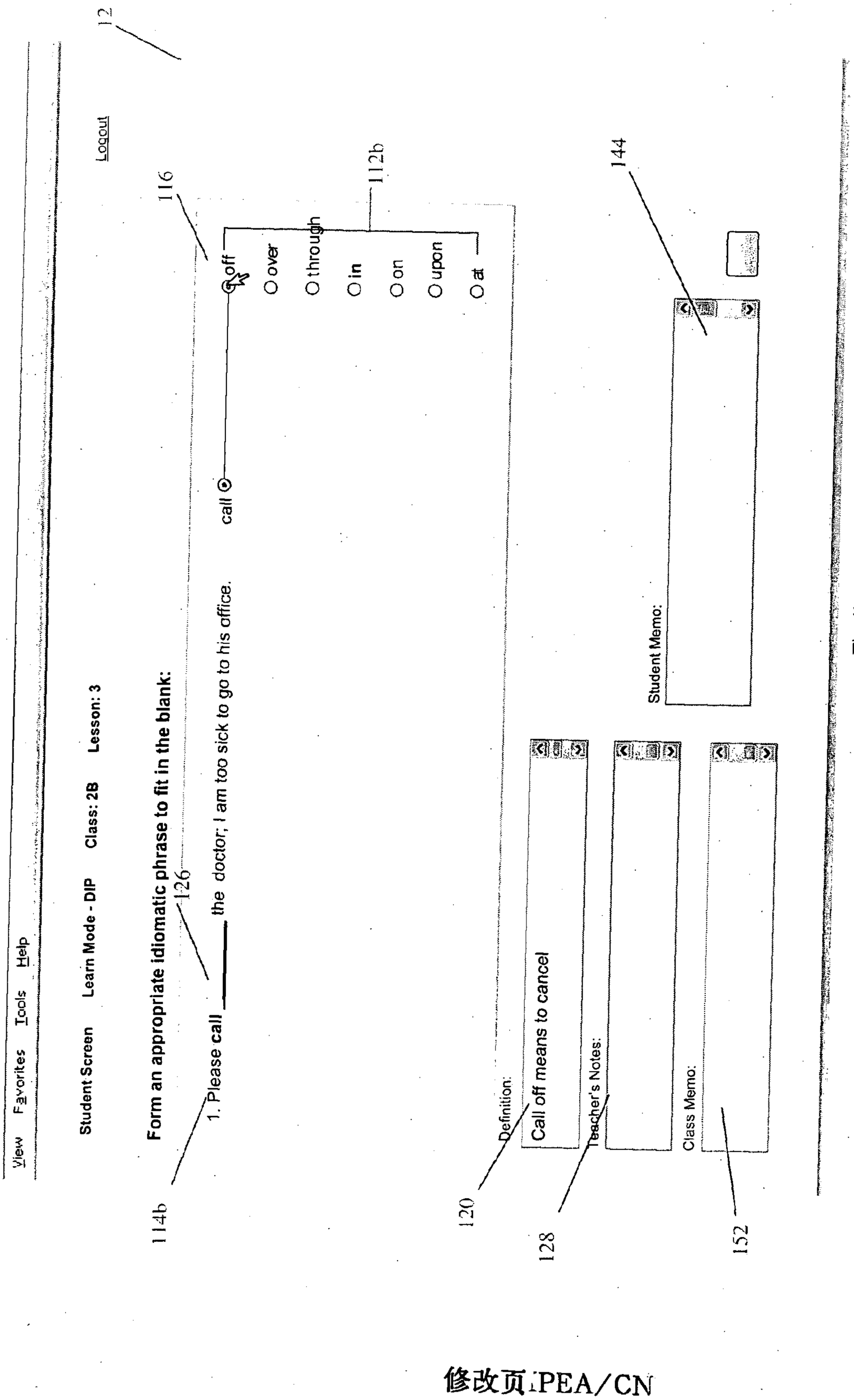


Fig 4b

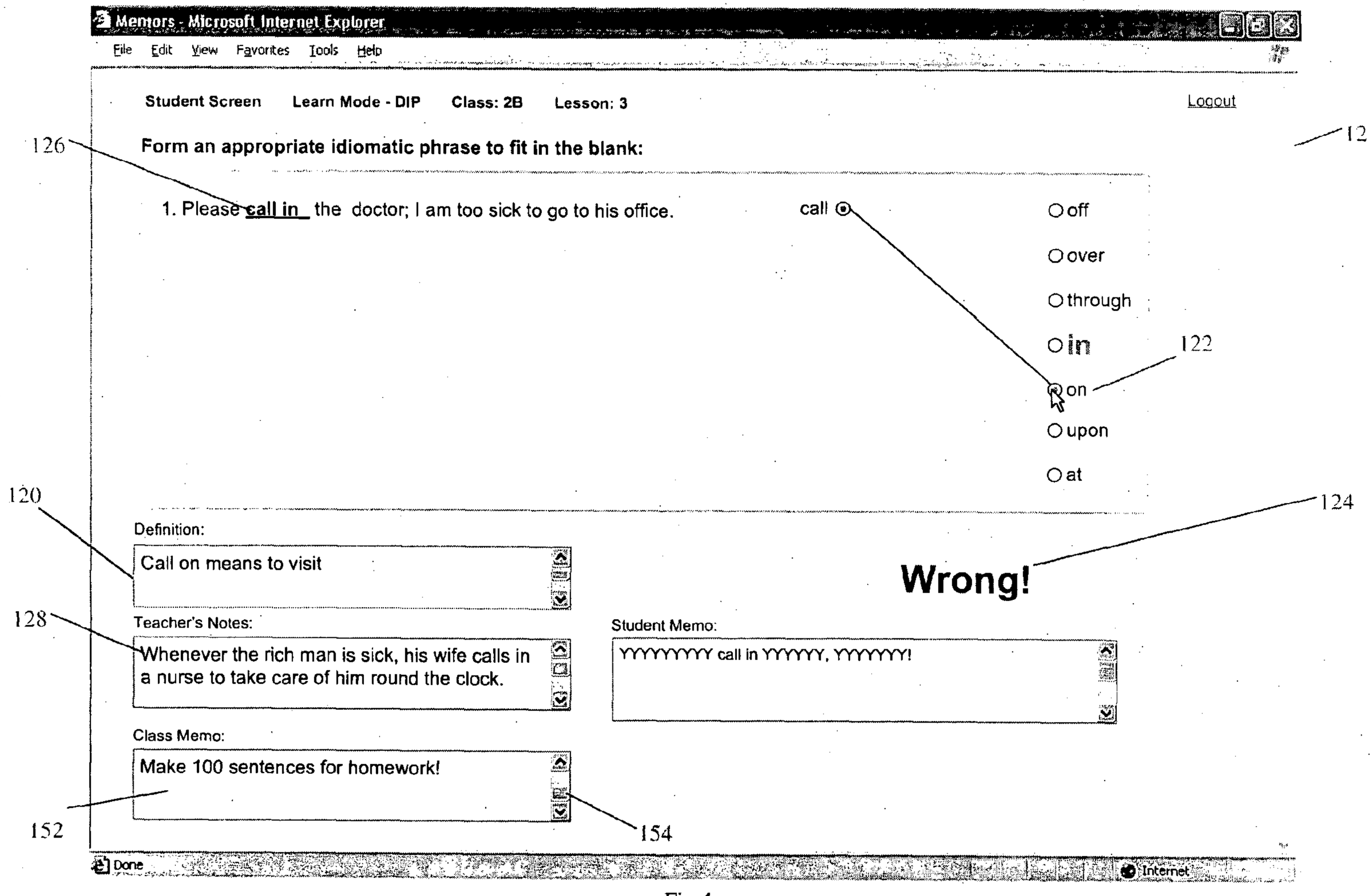


Fig 4c

CA 02632907 2008-04-11
8/23
13 · AUG 2007 (13 · 08 · 2007)

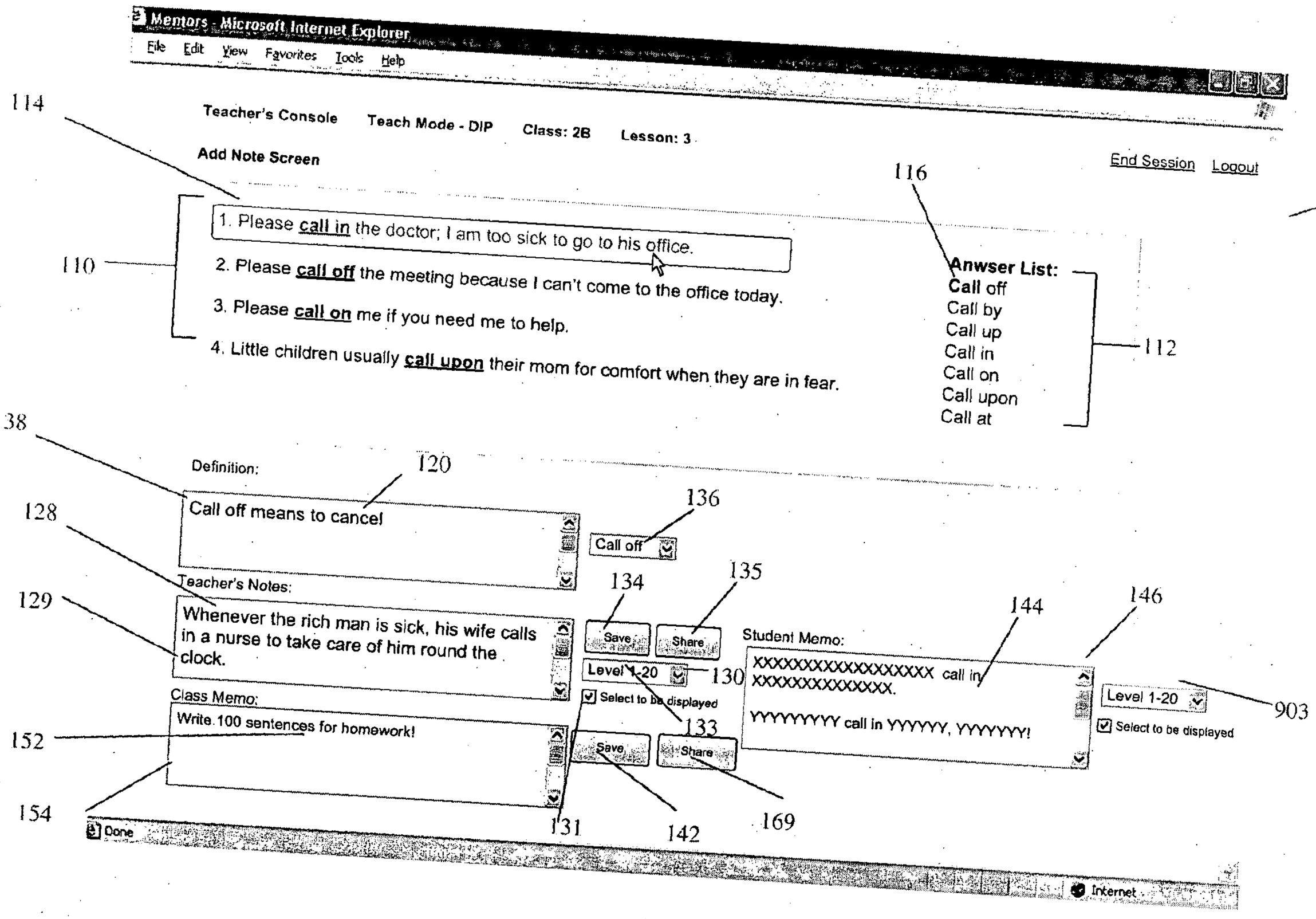


Fig 4d

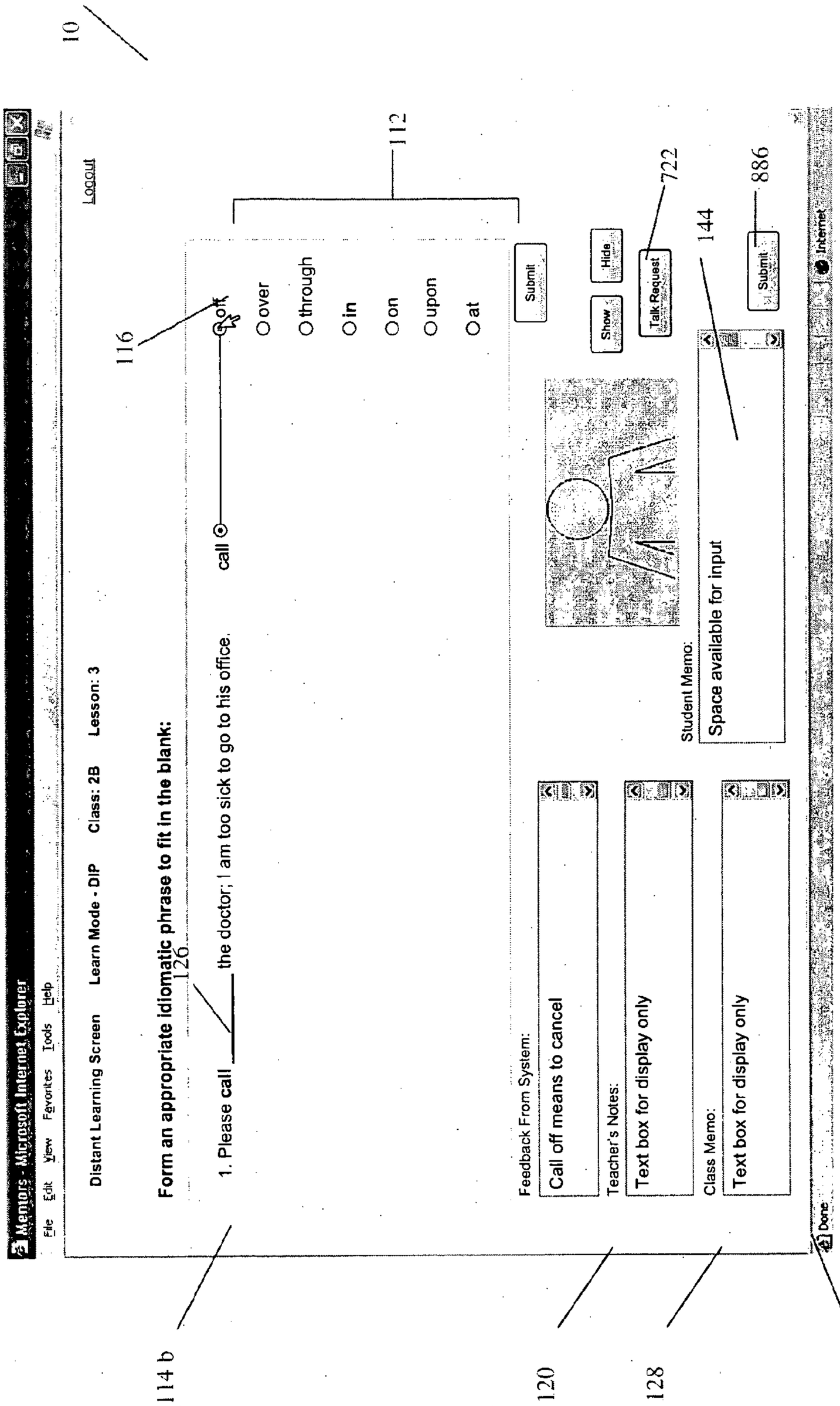

10
Memors - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Logout
Distant Learning Screen Learn Mode - DIP Class: 2B Lesson: 3
Form an appropriate idiomatic phrase to fit in the blank:
1. Please call ___ the doctor; I am too sick to go to his office.
call
off
over
through
in
on
upon
at
Submit
Show
Hide
Talk Request
Submit
Internet
Student Memo:
Space available for input
Feedback From System:
Call off means to cancel
Teacher's Notes:
Text box for display only
Class Memo:
Text box for display only
Done
116
112
722
144
886
114 b
120
128
152

Fig 4e

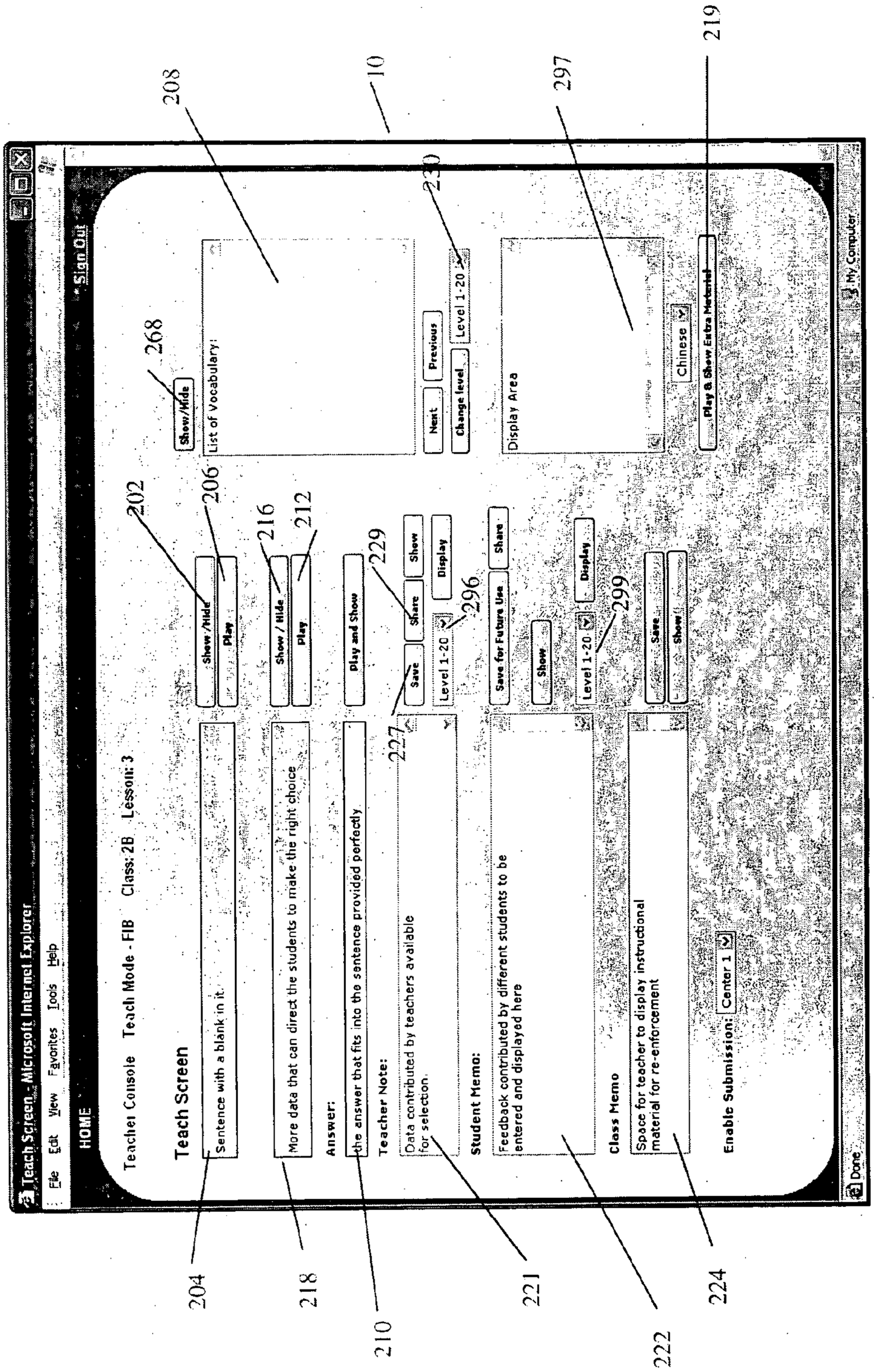


Fig 5a

修改页:PEA/CN

13 AUG 2007 (13-08-2007)

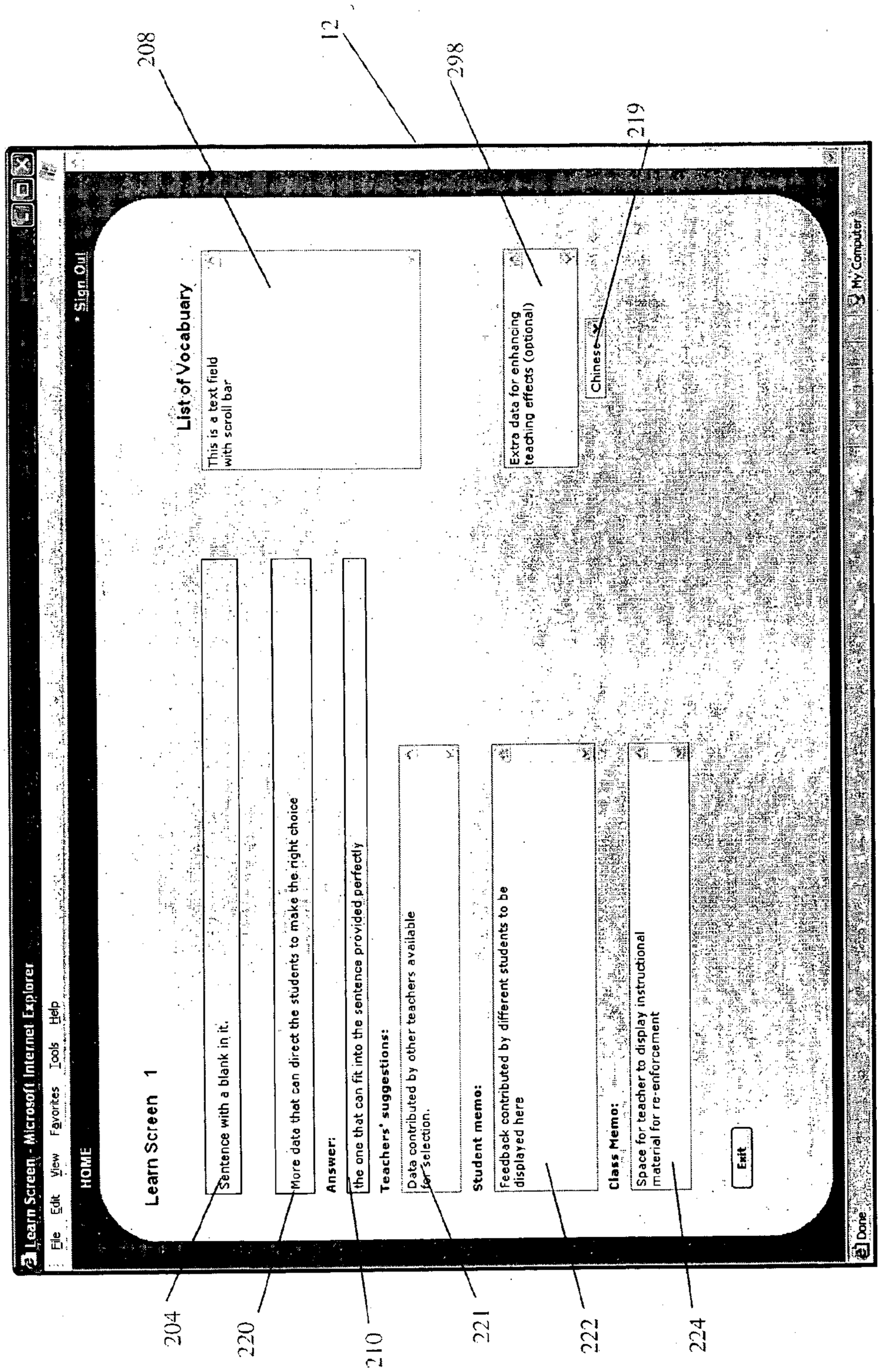


Fig 5b

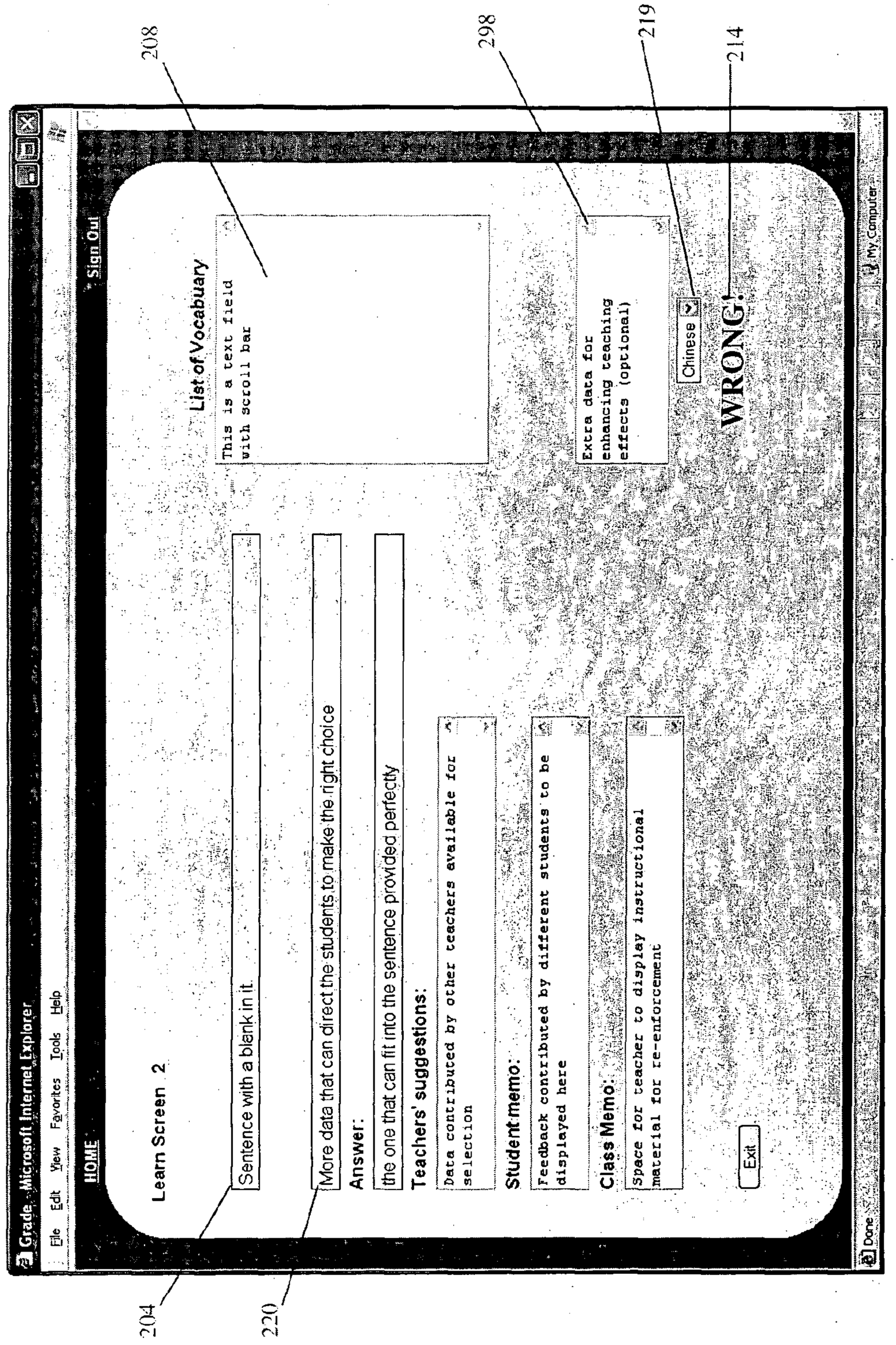

208
298
219
214
Sign Out
List of Vocabuary
This is a text field with scroll bar
Extra data for enhancing teaching effects (optional)
Chinese
WRONG!
My Computer
Learn Screen 2
Sentence with a blank in it
More data that can direct the students to make the right choice
Answer:
the one that can fit into the sentence provided perfectly
Teachers' suggestions:
Student memo:
Class Memo:
Exit
HOME
204
220

Fig 5c

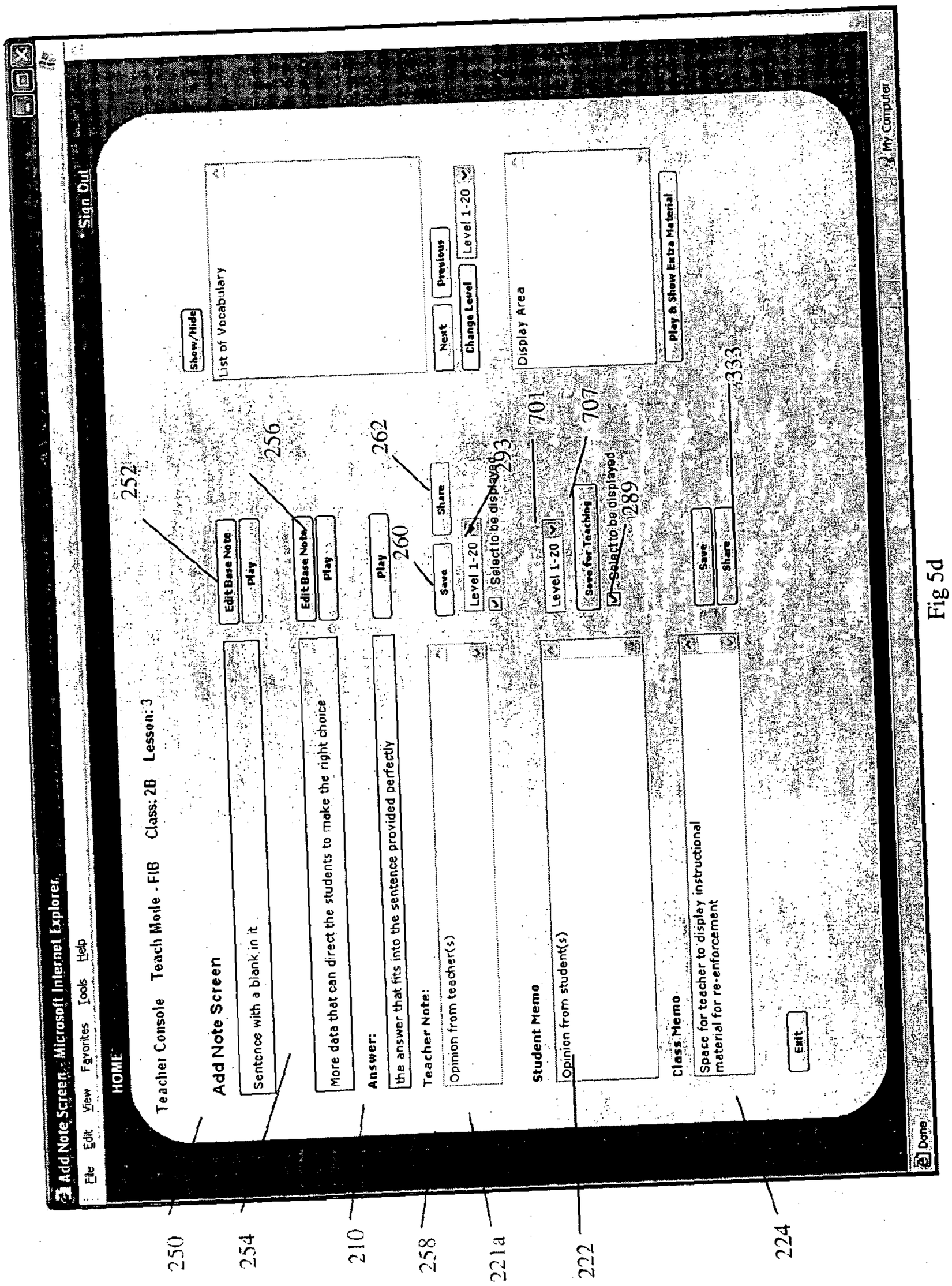


Fig 5d

修改页:PEA/CN

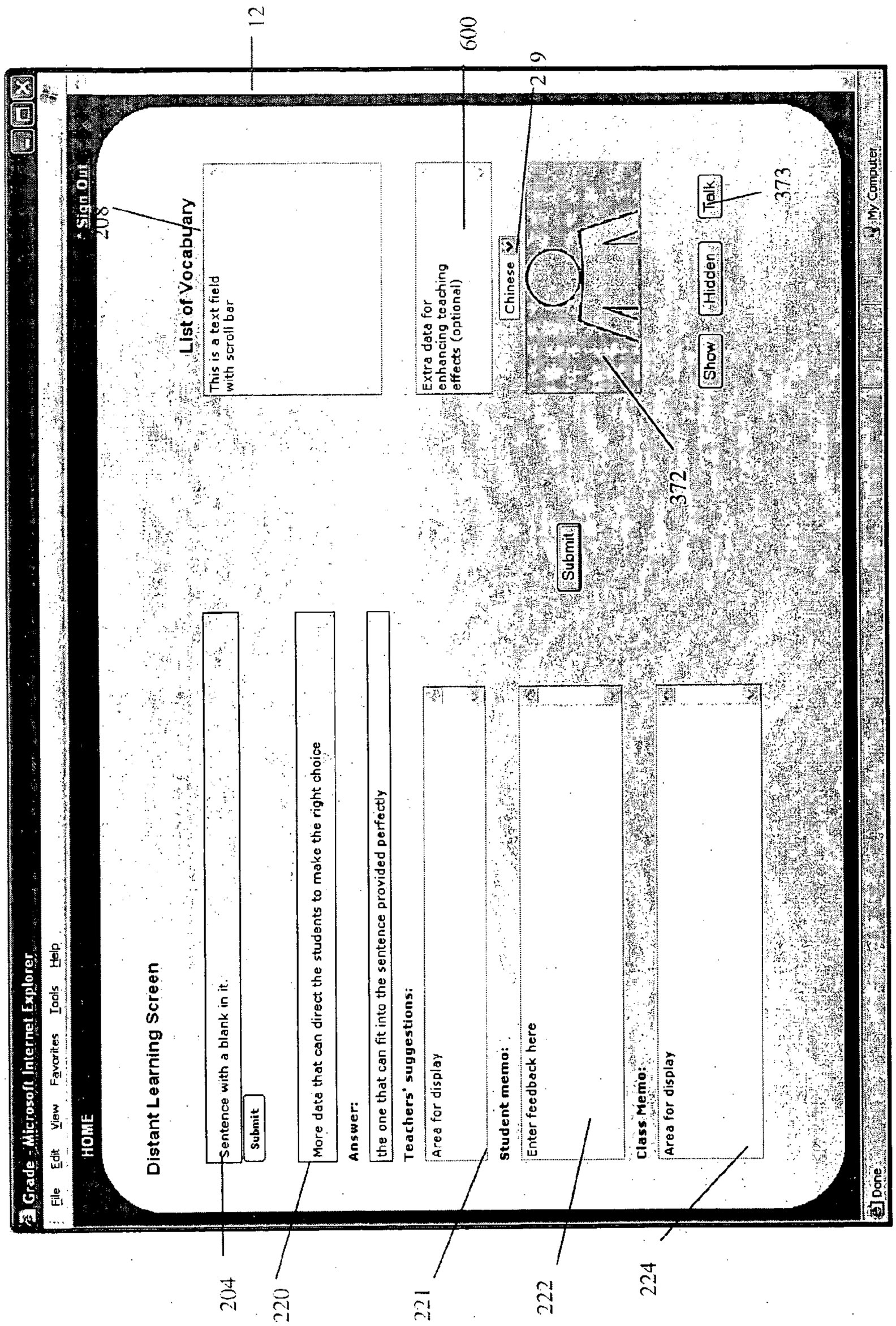

12
600
29
208
373
372
204
220
221
222
224
Grade - Microsoft Internet Explorer
File Edit View Favorites Tools Help
HOME
Distant Learning Screen
Sign Out
List of Vocabulary
This is a text field with scroll bar
Extra data for enhancing teaching effects (optional)
Chinese
Show
Hidden
Talk
Sentence with a blank in it.
Submit
More data that can direct the students to make the right choice
Answer:
the one that can fit into the sentence provided perfectly
Teachers' suggestions:
Area for display
Student memo:
Enter feedback here
Class Memo:
Area for display
My Computer
Done

Fig 5e

16/23

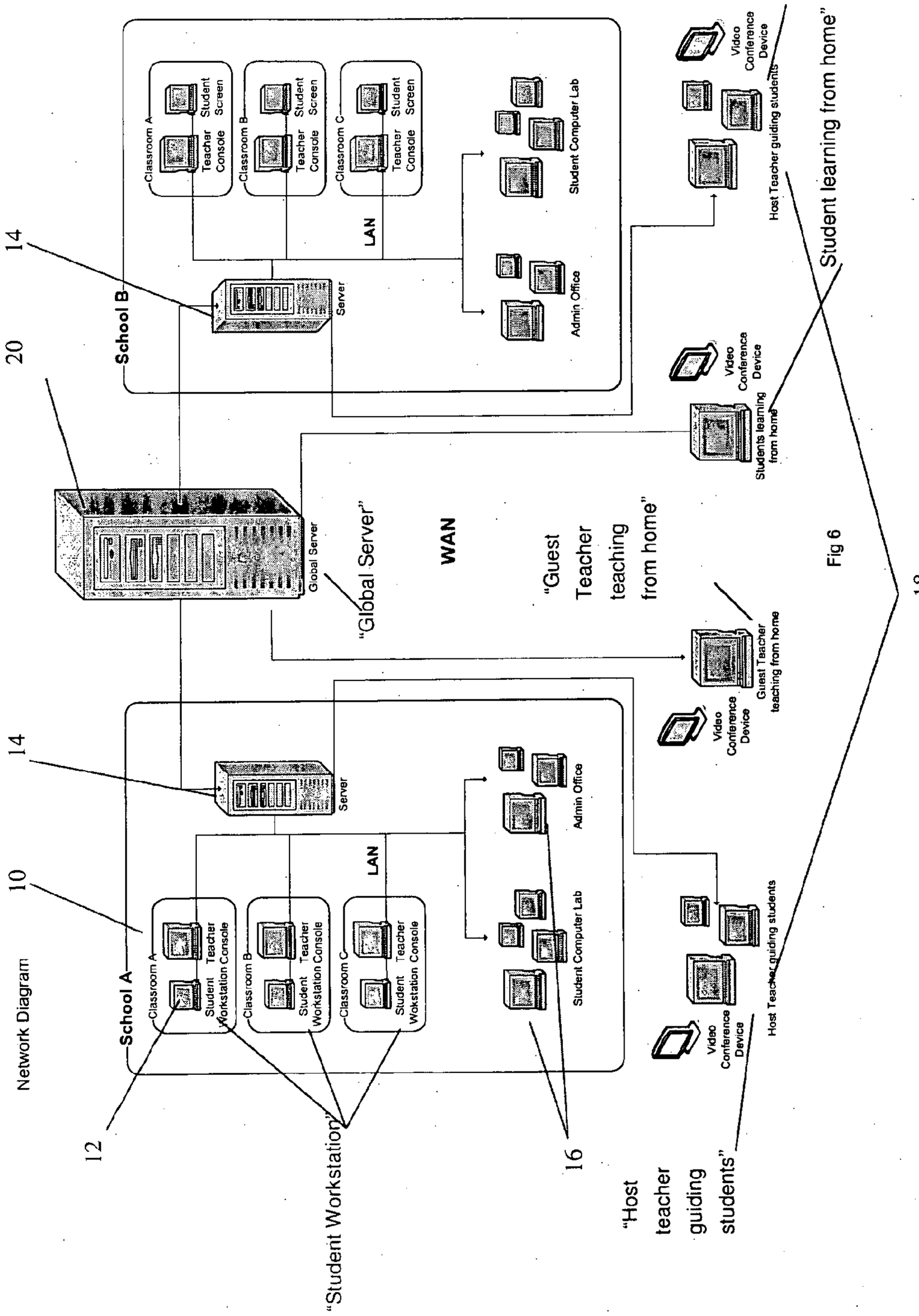


Fig 6

修改页.PEA/CN

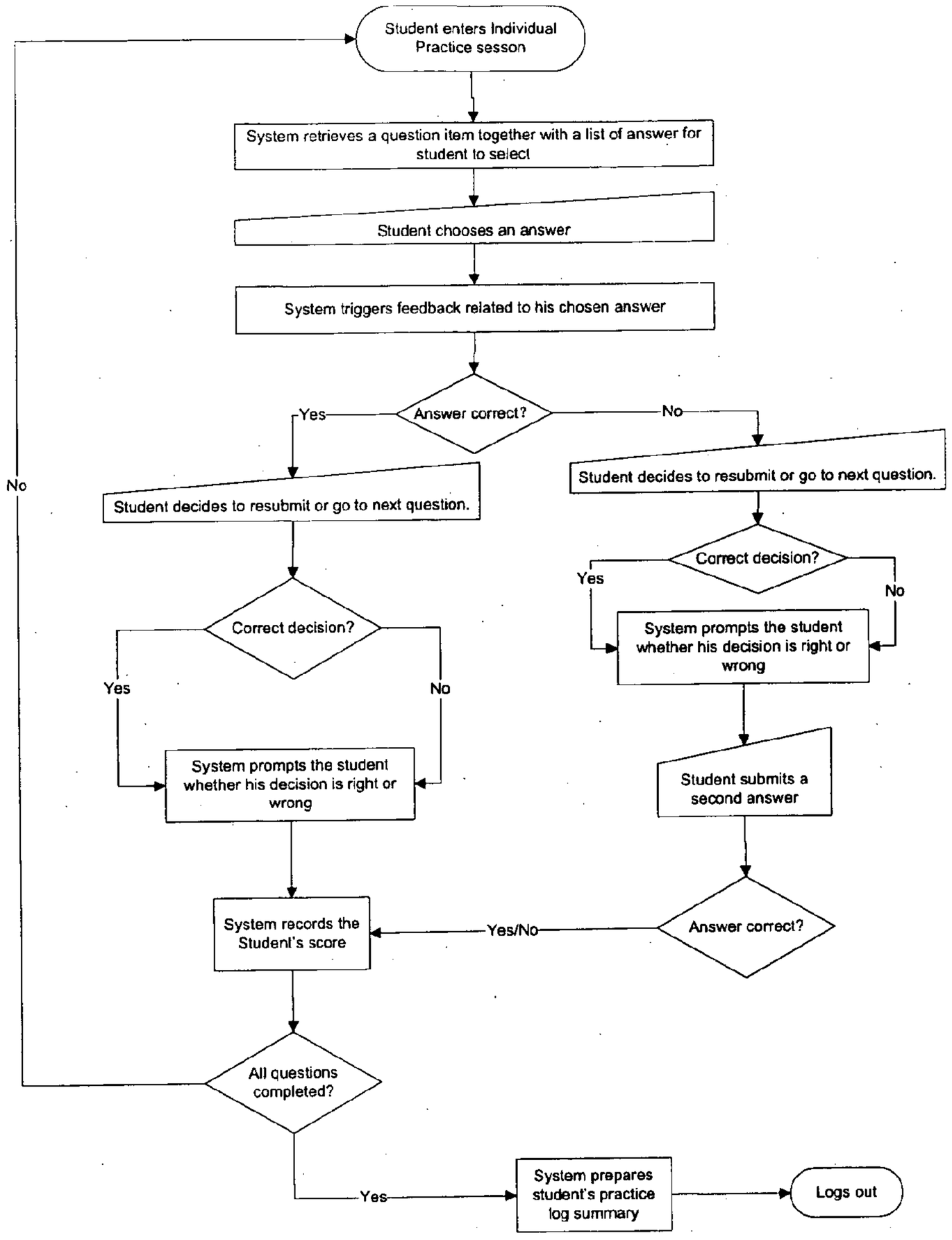

Student enters Individual Practice sesson
System retrieves a question item together with a list of answer for student to select
Student chooses an answer
System triggers feedback related to his chosen answer
Answer correct?
Yes
No
Student decides to resubmit or go to next question.
Correct decision?
Yes
No
System prompts the student whether his decision is right or wrong
Student decides to resubmit or go to next question.
Correct decision?
Yes
No
System prompts the student whether his decision is right or wrong
Student submits a second answer
Answer correct?
Yes/No
System records the Student's score
All questions completed?
No
Yes
System prepares student's practice log summary
Logs out

Fig 7

13 · AUG 2007 (13 · 08 · 2007)

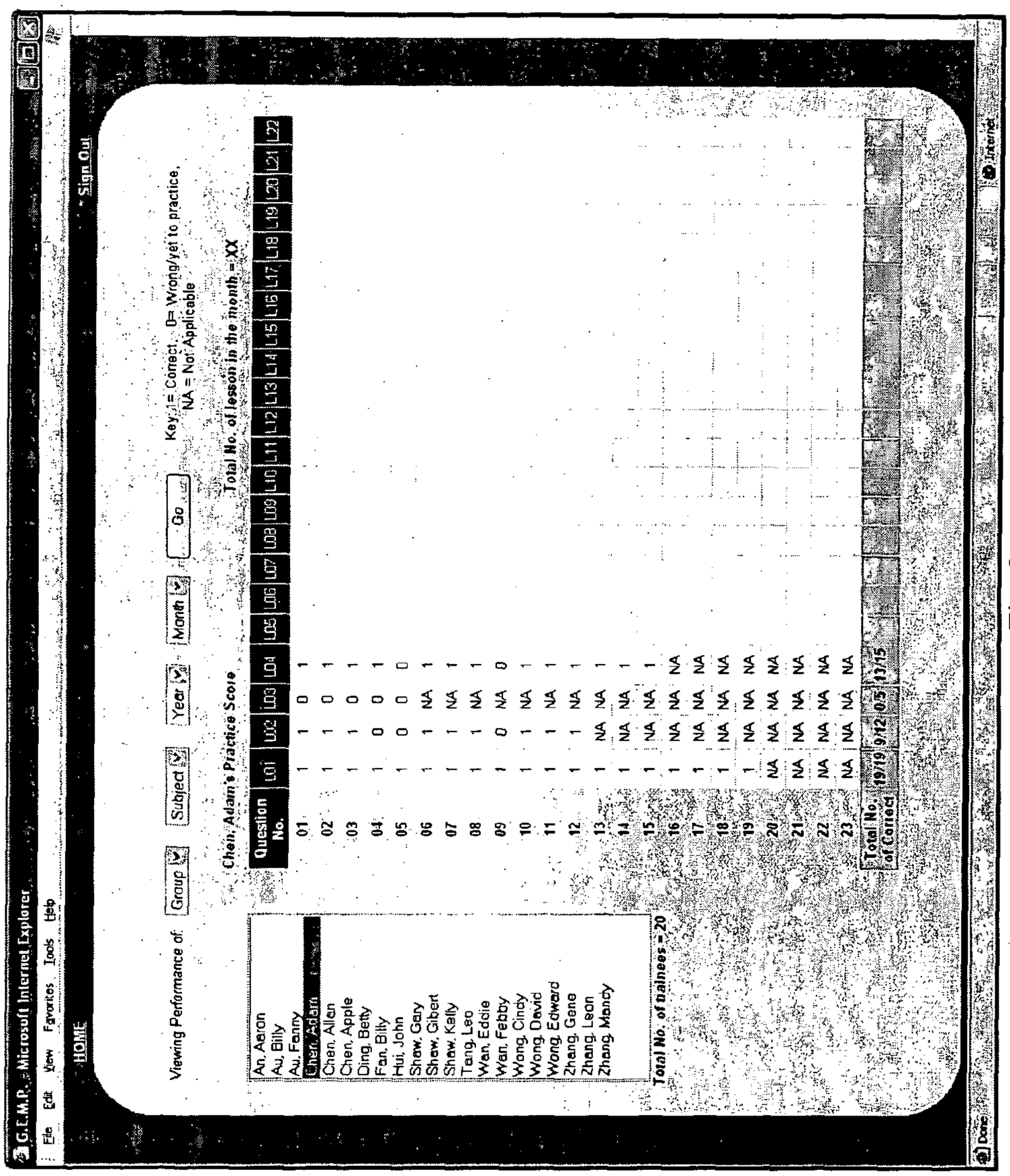


Fig. 8

修改页:PEA/CN

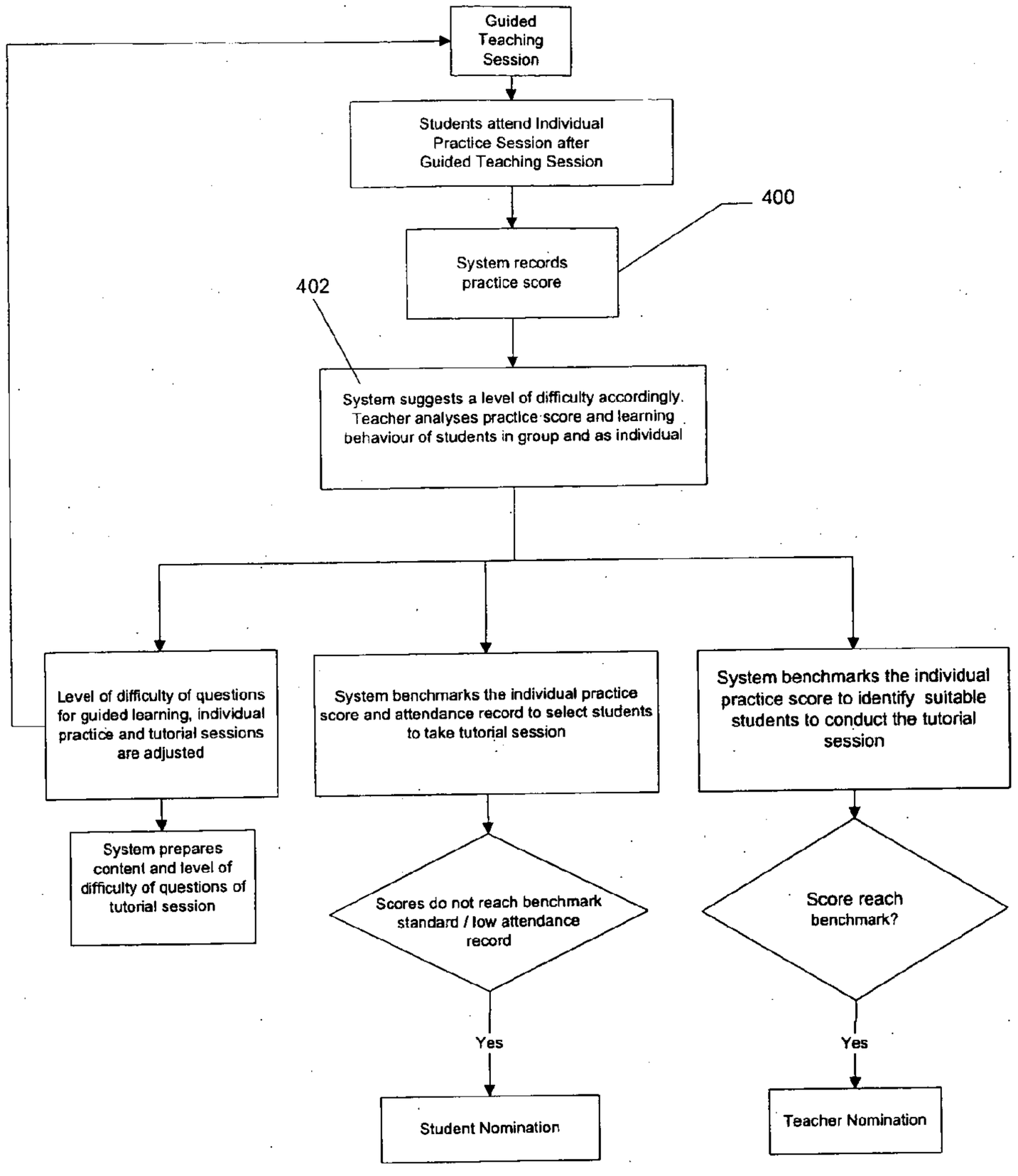

Guided Teaching Session
Students attend Individual Practice Session after Guided Teaching Session
400
System records practice score
402
System suggests a level of difficulty accordingly. Teacher analyses practice score and learning behaviour of students in group and as individual
Level of difficulty of questions for guided learning, individual practice and tutorial sessions are adjusted
System prepares content and level of difficulty of questions of tutorial session
System benchmarks the individual practice score and attendance record to select students to take tutorial session
Scores do not reach benchmark standard / low attendance record
Yes
Student Nomination
System benchmarks the individual practice score to identify suitable students to conduct the tutorial session
Score reach benchmark?
Yes
Teacher Nomination

Fig 9

13 · AUG 2007 (13 · 08 · 2007)

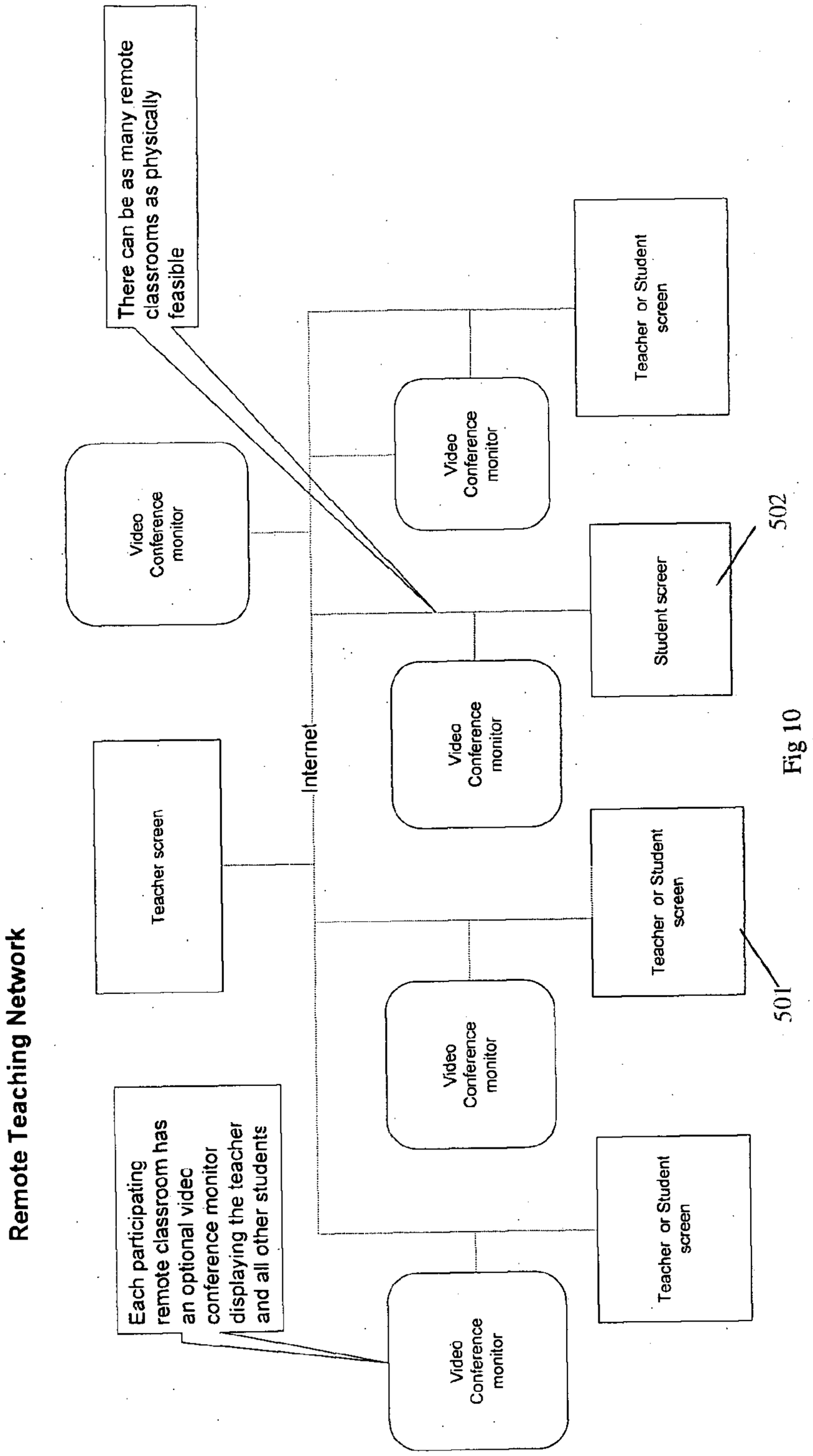


Fig 10

13 · AUG 2007 (13 · 08 · 2007)

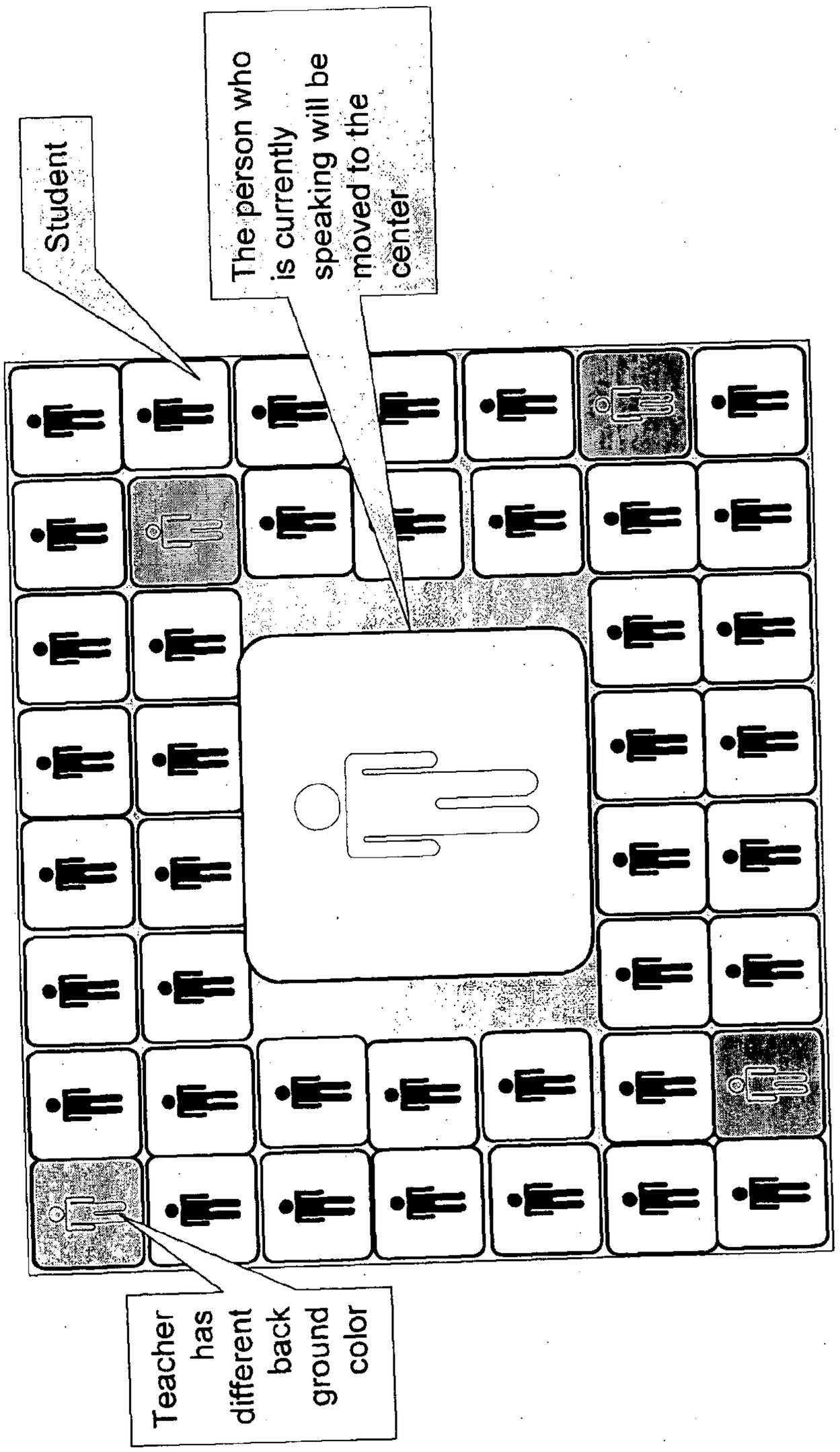


Fig 11

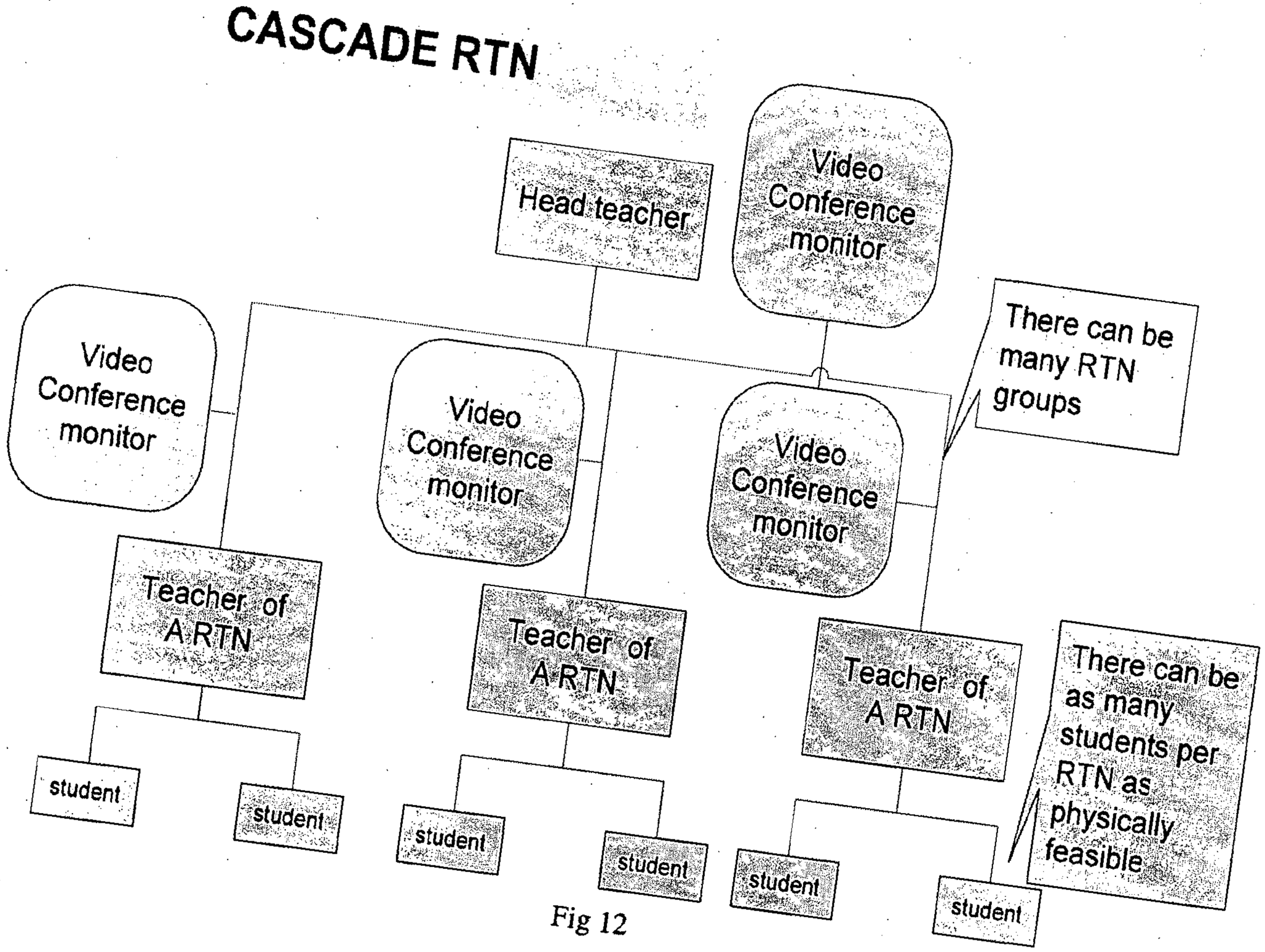


Fig 12

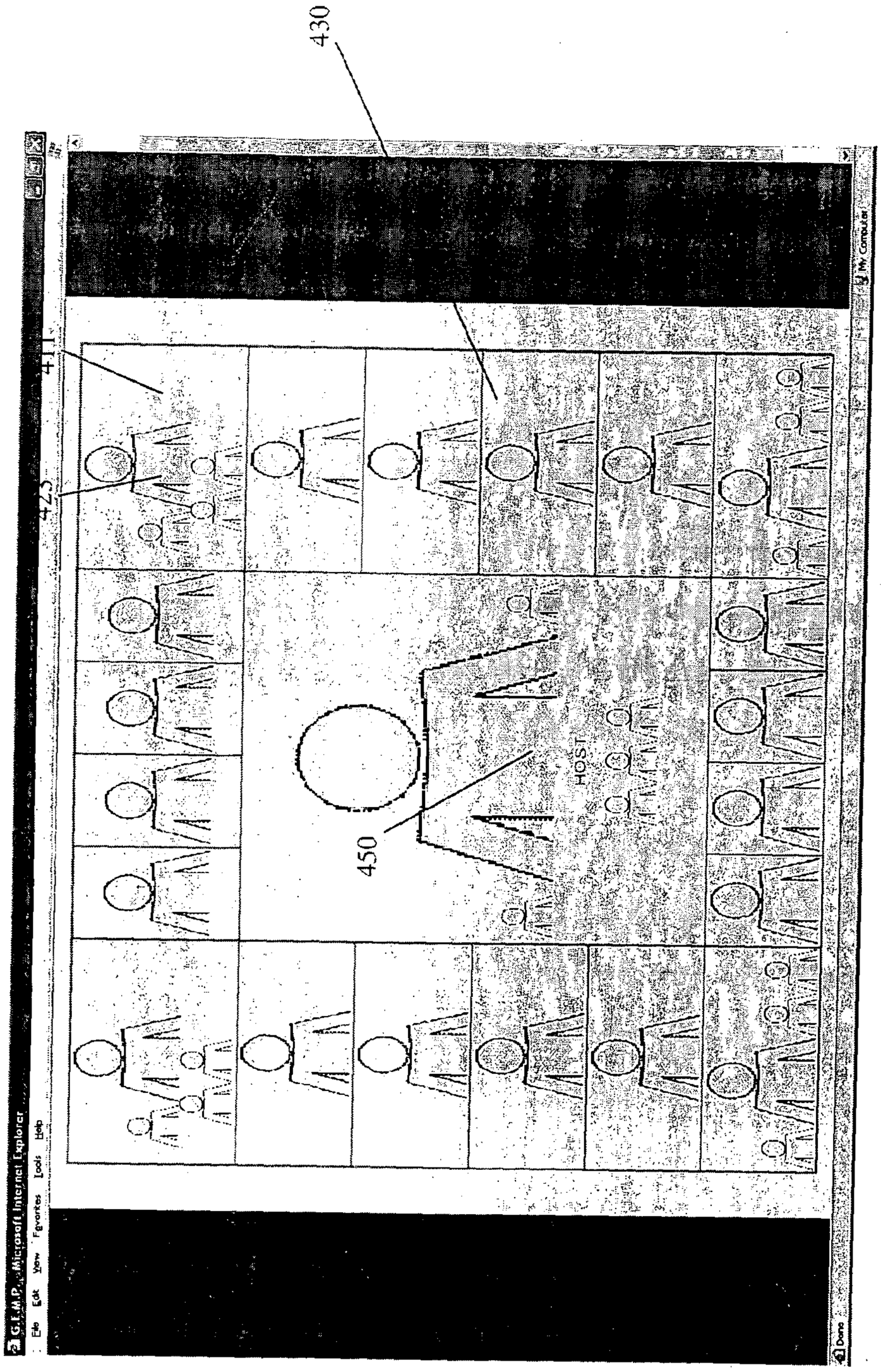

430
411
423
450
HOST
G.I.M.P. - Microsoft Internet Explorer
File Edit View Favorites Tools Help
My Computer
Done

Fig 13

Show more & prompt

Teacher commands to display some more information on student screen and explain why the answer is wrong. He then encourages a second attempt

312

Teacher enters the student's second answer choice using the teacher workstation anc display the consequence on student display

314

Answer correct ?

Yes

Nc

System prompts that the answer is correcl

System prompts that the choice is wrong and denotes the right answer

316

Show & challenge