

6. The method of claim 1, wherein the calculating step is performed on the subject user's computer, portable media device, personal digital assistant, or mobile email receiver.
7. The method of claim 1, wherein the calculating in step c includes identification of equivalent responses, said identification being performed by a computer.
8. The method of claim 1, wherein the calculating in step c includes identification of equivalent responses, said identification being is performed by a person different from the subject user.
9. The method of claim 1, wherein the calculating a list of one or more prior free text responses from other subject users (step c) is performed electronically by matching key words of the subject user's response to those in prior responses.
10. The method of claim 1, wherein the question comprises a target curriculum; and the method further comprising: g. creating a set of curricular objectives; h. developing a set of questions and answers that teach the set of curricular objectives.
11. The method of claim 1, further comprising the step of providing the subject user with the correct answer(s) to the question and/or educational material to foster learning about the topic covered by the question.
12. The method of claim 1, wherein the correctness of the answer and its components is determined by one or more computers.
13. The method of claim 1, wherein the correctness of the answer and its components is determined by one or more persons.
14. The method of claim 1, wherein the responses to the questions and their metadata (including but not limited to popularity and equivalent answers) are entered into a searchable electronic database.
15. The method of claim 1, wherein step a further comprises presenting a set of pre-determined answer choices and a free text response box to the subject user at the computer device, wherein step b further comprises electronically recording, by the server computer, the subject user's answer, wherein, in step c, the response of the subject user is a free text response of the subject user, wherein, in step e, the one or more prior responses on the list are one or more free text responses on the list, wherein, in step e, the subject user's response is the subject user's free text response, and wherein, in step f, the equivalent response is an equivalent free text response.
16. A computer system for collecting information from users and aggregating it into a useful format, comprising: a server computer; a computer device coupled to the server computer by a communication network, the server computer and the computer device being operatively configured to: a. present a question to a subject user; b. electronically record the subject user's free text response to the question; c. calculate a list of one or more prior free text responses from other subject users which may be equivalent to response of the subject user; d. present the calculated list of potentially-equivalent free text responses from other subject users to the subject user; e. the subject user selecting if one or more prior responses on the list is equivalent to the subject user's response or if none on the list is equivalent; and f. electronically record the subject user's selection of an equivalent response; such that responses from the subject user are collected and aggregated into the responses from other users in a manner resulting in useful aggregate information.
17. The system of claim 16, wherein the question is electronically delivered to the subject user through electronic mail, text message, or other method of

electronic delivery.

18. The system of claim 17, wherein the electronic mail or text message or other system of electronic delivery comprises hyperlink to a web-page where the subject user can submit the subject user's answer to the question.
19. The system of claim 16, wherein the calculating step is performed at a central server.
20. The system of claim 16, wherein the step of presenting the question is accomplished by delivering the question to a computer, portable media device, personal digital assistant, or mobile email receiver as the computer device.
21. The system of claim 16, wherein the calculating step is performed on the subject user's computer, portable media device, personal digital assistant, or mobile email receiver.
22. The system of claim 16, wherein the calculating in step c includes identification of equivalent responses, said identification being performed by a computer.
23. The system of claim 16, wherein the calculating in step c includes identification of equivalent responses, said identification being is performed by a person different from the subject user.
24. The system of claim 16, wherein the calculating a list of one or more prior free text responses from other subject users (step c) is performed electronically by matching key words of the subject user's response to those in prior responses.
25. The system of claim 16, wherein the question comprises a target curriculum; and the system further comprising: g. creating a set of curricular objectives; h. developing a set of questions and answers that teach the set of curricular objectives.
26. The system of claim 16, further comprising the step of providing the subject user with the correct answer(s) to the question and/or educational material to foster learning about the topic covered by the question.
27. The system of claim 16, wherein the correctness of the answer and its components is determined by one or more computers.
28. The system of claim 16, wherein the correctness of the answer and its components is determined by one or more persons.
29. The system of claim 16, wherein the responses to the questions and their metadata (including but not limited to popularity and equivalent answers) are entered into a searchable electronic database.
30. The system of claim 16, wherein step a further comprises presenting a set of pre-determined answer choices and a free text response box to the subject user at the computer device, wherein step b further comprises electronically recording, by the server computer, the subject user's answer, wherein, in step c, the response of the subject user is a free text response of the subject user, wherein, in step e, the one or more prior responses on the list are one or more free text responses on the list, wherein, in step e, the subject user's response is the subject user's free text response, and wherein, in step f, the equivalent response is an equivalent free text response.

[0010] In one embodiment, the system and method of the present invention provides the user with feedback and educational material to foster learning about the pertinent concepts. The present invention, by combining a free-text question-answer process with the provision of feedback, improves the learner's ability to learn, recall, and retain items of information.

[0011] In another embodiment, the user is asked to report whether his selected answer from the calculated list is a correct answer to the question. This can be an important step, since the popularity of an answer does not necessarily correlate with its correctness. In embodiments, correctness can also be determined by one or more computers or one or more other people.

[0012] In another embodiment, the spacing, difficulty, and/or content of subsequent questions and educational material is customized for each learner based on the correctness of his answer.

[0013] While the primary focus of this method and system is to improve the educational process, it has not escaped Applicant's notice that this method and system is also an excellent means to aggregate free-text responses to questions. This is of particular value now that online search engines are aiming to be able to answer submitted questions, not just provide a list of relevant web sites. The method and system in this disclosure allow for the population of a database with the answers to questions, with weightings given to the answers based on the popularity and correctness of the answers.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The foregoing will be apparent from the following more particular description of example embodiments of the invention, as illustrated in the accompanying drawings in which like reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating embodiments of the present invention.

[0015] The accompanying drawings illustrate an embodiment of the invention and depict the above-mentioned and other features of this invention and the manner of attaining them. In the drawings:

[0016] FIG. 1 shows a flowchart illustrating a process of collection and distribution of free-text information in accordance with the present invention.

[0017] FIG. 2 shows the presentation of a question to a user to which the user can submit a free-text response.

[0018] FIG. 3 shows the presentation of a list of potentially-equivalent free text responses to the user, and asking him to select if one or more prior responses on the list is (are) equivalent to his response or if none on the list is equivalent.

[0019] FIG. 4 shows the presentation to the user of the correct answer(s) to the question(s) and/or educational material to foster learning about the topic covered by the question.

[0020] FIG. 5 shows the re-presentation of the question and a newly-calculated list of selected responses to the user and electronically recording which response on this list the user selects as the best response to the question.

[0021] FIG. 6 shows the presentation to the user of a list of answer(s) to the question(s) and/or educational material to foster learning about the topic covered by

the question. The user may be asked to determine whether his selected answer is correct or incorrect or whether the question has no correct/incorrect answer.

[0022] FIG. 7 shows the presentation to the user of a list of answer(s) to the question(s) and/or educational material to foster learning about the topic covered by the question.

[0023] FIG. 8 is a schematic view of a computer network in which embodiments of the present invention are deployed.

[0024] FIG. 9 is a block diagram of a computer node in the network.

DETAILED DESCRIPTION OF THE INVENTION

[0025] A description of example embodiments of the invention follows. The entire teachings of PCT Publication no. WO 2008/008370 published Jan. 17, 2008 for "Adaptive Spaced Teaching Method and System" are herein incorporated.

[0026] FIG. 8 illustrates a computer network or similar digital processing environment in which the present invention may be implemented. An exemplary system 100 is shown and described.

[0027] Client computer(s)/devices 50 and server computer(s) 60 provide processing, storage, and input/output devices executing application programs and the like. Client devices 50 may be, for example, a desktop or laptop computer, a portable media device, a personal digital assistant, a mobile communication device and the like. Client computer(s)/devices 50 can also be linked through communications network 70 to other computing devices, including other client devices/processes 50 and server computer(s) 60. Communications network 70 can be part of a remote access network, a global network (e.g., the Internet), a worldwide collection of computers, Local area or Wide area networks, and gateways that currently use respective protocols (TCP/IP, Bluetooth, etc.) to communicate with one another. Other electronic device/computer network architectures are suitable.

[0028] FIG. 9 is a diagram of the internal structure of a computer (e.g., client processor/device 50 or server computers 60) in the computer system of FIG. 8. Each computer 50, 60 contains system bus 79, where a bus is a set of hardware lines used for data transfer among the components of a computer or processing system. Bus 79 is essentially a shared conduit that connects different elements of a computer system (e.g., processor, disk storage, memory, input/output ports, network ports, etc.) that enables the transfer of information between the elements. Attached to system bus 79 is I/O device interface 82 for connecting various input and output devices (e.g., keyboard, mouse, displays, printers, speakers, etc.) to the computer 50, 60. Network interface 86 allows the computer to connect to various other devices attached to a network (e.g., network 70 of FIG. 8). Memory 90 provides volatile storage for computer software instructions 92 and data 94 used to implement an embodiment of the present invention (e.g., system process 100 of FIG. 1 and user interface operations of FIGS. 2 through 7 and supporting code detailed below). Disk storage 95 provides non-volatile storage for computer software instructions 92 and data 94 used to implement an embodiment of the present invention. Central processor unit 84 is also attached to system bus 79 and provides for the execution of computer instructions.

[0029] In one embodiment, the processor routines 92 and data 94 are a computer program product (generally referenced 92), including a computer readable medium (e.g., a removable storage medium such as one or more DVD-ROM's, CD-ROM's, diskettes, tapes, etc.) that provides at least a portion of the software instructions for the invention system. Computer program product 92 can be installed by any suitable software installation procedure, as is well known in the art. In another embodiment, at least a portion of the software instructions may also be downloaded over a cable, communication and/or wireless connection. In other embodiments, the invention programs are a computer program propagated signal product 107 embodied on a propagated signal on a propagation medium (e.g., a

radio wave, an infrared wave, a laser wave, a sound wave, or an electrical wave propagated over a global network such as the Internet, or other network(s). Such carrier medium or signals provide at least a portion of the software instructions for the present invention routines/program 92.

[0030] In alternate embodiments, the propagated signal is an analog carrier wave or digital signal carried on the propagated medium. For example, the propagated signal may be a digitized signal propagated over a global network (e.g., the Internet), a telecommunications network, or other network. In one embodiment, the propagated signal is a signal that is transmitted over the propagation medium over a period of time, such as the instructions for a software application sent in packets over a network over a period of milliseconds, seconds, minutes, or longer. In another embodiment, the computer readable medium of computer program product 92 is a propagation medium that the computer system 50 may receive and read, such as by receiving the propagation medium and identifying a propagated signal embodied in the propagation medium, as described above for computer program propagated signal product.

[0031] Generally speaking, the term "carrier medium" or transient carrier encompasses the foregoing transient signals, propagated signals, propagated medium, storage medium and the like.

[0032] Illustrated in FIG. 1 is a flow diagram of a process of collection and distribution of free text information in one embodiment (system 100) of the present invention. At Step 1 a subject user of a device 50 receives a question provided by host web page server 60. Email, text message or other electronic delivery techniques are employed. Optionally in Step 2 the user connects from an email application to the web page (server 60) hosting the question. Hyperlink or equivalent technology may be utilized. In turn, the user answers the question with a free-text response through his electronic device 50 (at Step 3). Device 50 and server 60 communicate with each other over communications network 70 using known or common protocols and techniques. FIG. 2 is illustrative of a user interface screen view implementing Steps 1, 2 and 3.

[0033] In Step 4, server 60 calculates a list of potentially equivalent prior responses and presents this list to the subject user (through device 50) such as shown in FIG. 3. Identification of equivalent prior responses may be by a computer or with human intervention. This may be accomplished by keyword matching or other techniques. In Step 5, through device 50 (in working communication with server 60), the subject user selects if one or more prior responses on the presented list (FIG. 3) is/are equivalent to his response, or indicates if none on the presented list is equivalent.

[0034] In response, server 60 at Step 6 then calculates a selected list of responses to the question. In one embodiment, this includes correct answer(s) to the question and/or educational material fostering learning about the topic covered by the question. FIG. 4 is illustrative.

[0035] In another embodiment, server 60 calculates the selected list of responses to the question by tallying the most popular answers to the question as indicated by the number of equivalent answers submitted by users.

[0036] Step 7 (server 60 through device 50) then re-presents to the user the question and the calculated selected list of responses, such as in the illustrated screen view of FIG. 5. Step 8 (device 50) enables the user to select which response on the list as presented by Step 7 (FIG. 5) is the best response to the question. This may be by device 50 (as supported by server 60) presenting to the user a screen view having a list of answers to the questions and/or educational material on topic as in FIGS. 6 and 7. Optionally, in one embodiment, the screen view may ask the user to determine whether his answer is correct or incorrect.

[0037] In embodiments, server 60 and device 50 are configured at Step 7 so that the question and calculated selected list of responses to the question are re-presented to the user over spaced intervals of time until the user reaches a pre-established level of proficiency. The server 60/device 50 determine the temporal spacing of the question re-presentation by whether the user indicates that his selected answer (Step 8) is correct or incorrect or whether the question has no

metadata. Answers are internally represented by content (e.g. in free text format) and characteristics such as keywords, best answer indicator, popular answer count, link/pointer to equivalent answers, and the like metadata. Various data structures (at 94 in FIG. 9) are suitable for storing questions, their metadata/characteristics, answers and their metadata/characteristics. Similarly users may be internally represented in working memory 90, 95 by a user identifier, indication of operative proficiency level and working aspects such as current question, delivery time period (temporal spacing)/frequency, user's current submitted selections and free-text responses, prior responses, prior questions and the like metadata. Suitable data structures in data 94 are in the purview of one skilled in the art.

[0048] Server 60 and client device 50 may iterate Steps 6, 7 and 8 in order to refine which response is effectively equivalent to the user's response and/or which response the user selects is the best response to the question. In embodiments, server 60/device 50 repeat Steps 7 and 8 one or more times over spaced intervals of time, each time presenting the same calculated selected list of responses to the question from which the user selects the best answer. Or server 60/device 50 repeat Steps 6-8 one or more times over spaced intervals of time, each time presenting a newly-calculated selected list of responses to the question from which the user selects the best answer. The first and/or newly-calculated selected list may present the most popular responses to the question. The first and/or newly-calculated selected list may present prior responses selected based on multiple variables, including but not limited to popularity, syntax, and key words. Known techniques are used to accomplish this.

[0049] In other embodiments, the newly-calculated selected list may contain the same prior responses as when it was presented to the user previously.

[0050] In accordance with the foregoing, system 100 collects the user's responses (in free-text) and aggregates them with other user's free-text responses. This results in information in a useful free-text format, especially for enhancing knowledge retention and learning as illustrated above throughout the various embodiments.

[0051] The teachings of all patents, published applications and references cited herein are incorporated by reference in their entirety.

[0052] While this invention has been particularly shown and described with references to example embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the scope of the invention encompassed by the appended claims.

[0053] For example, the foregoing describes a client-server architecture implementing one embodiment of the present invention. Other computer architectures, configurations and/or arrangements for implementing embodiments of the invention are suitable.

[0054] Further, the foregoing refers to questions generally. One example are test items (test questions). Other types of questions and queries are suitable.

[0055] In another example, the user's free text responses are limited to a threshold number of characters, such as 140 characters.

[0056] In yet a further example, server 60 is a central processing component (host-server) of system 100. The questions, responses and/or educational material are delivered on-line over a communications or other network 70.

[0057] In another example embodiment, server 60 employs a pre-determined interval of time to separate the initial presentation of the question for a free-text response by the user (Steps 1, 2, 3) and the re-presentation of the question and the selected list of responses of Steps 7 and 8.

