INSTRUCTIONAL DESIGN OF CALL: A PERSPECTIVE OF FLEXIBILITY, LEARNING GOAL, AND COMPUTER ROLES

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Abstract: Instructional Design of Call: A Perspective of Flexibility, Learning Goal, and Computer Roles. The purpose of this study is to review instructional design (ID) used in computer assisted language learning (CALL) studies. The Eight models of ID derived from three different dimensions of online learning, namely: learning content delivery (flexibility), learning goal, and computer roles serve as the basis of analysis for the corpus CALL-related articles which become the source of data. A hundred and forty-seven articles were reviewed resulting in eighty-six articles matching the curent study. The findings show that 5 out of eight models emerge in the CALL literature. Details about learning flexibility and computer roles are discussed in the article.

Key words: CALL, instructional design, typology, flexibility

Abstrak: Desain Pembelajaran Bahasa berbasis Computer. Kajian ini bertujuan untuk mengulas rancangan pembelajaran yang digunakan dalam penelitian bertemakan pembelajaran berbasis komputer. Delapan tipologi rancangan pembelajaran berbasis komputer dijadikan landasan untuk menganalisis korpus data (artikel) yang berhasil dikumpulkan dari berbagai jurnal. Tipologi tersebut diturunkan dari tiga dimensi pembelajaran daring (online). Sebanyak 147 artikel berhasil diunduh namun hanya 86 artikel yang layak untuk menjadi sumber data. Temuan menunjukkan bahwa 5 dari 8 tipologi berhasil diidentifikasi. Diskusi berkaitan dengan pembelajaran fleksibel dan peran komputer dibahas lebih lengkap di bagian pembahasan.

Kata kunci: CALL, instructional design, typology, flexibility

The trend of utilising CALL has shifted the attention of foreign language teaching practitioners from being traditional (f I ace-to-face instruction) to be more technological in approaching the learning process. The shift has brought about changes of how instruction is designed to meet the needs of learners for the sake of achieving the learning goals (Johnson, Aragon, Shaik, & Palma-Rivas, 2000).

Furthermore, CALL instructional design (ID herein after) should not simply copy the ID from the traditional classroom (Herrington, Reeves, & Oliver, 2010) as the nature of CALL and traditional learning is different (Zheng & Dahl, 2010). They both are different at least in terms of the teacher-learner interaction, learning resources, and mode of communication.

CALL, however, does not automatically guarantee successful learning in the classroom. Learning success in the classroom is crucially determined by how instruction designed provides supporting learning environment to enable the learner to process information (Grabowski, 1996). It lies on the teacher's creativity in designing her instruction to be more learner-centred and challenging.

Focus of CALL, as many suggest, should be task-oriented emphasising on the learning process (Seel & Dijkstra, 2006); and focusing on the learner. By task-based learning, certain knowledge is gained by accomplishing a certain task. The task should be facilitated by communication which can be done anytime and anywhere; to develop an ability to design own learning as the end goal (Morales, 2010).

The issue of D of CALL emerges. Yet, constructivist-based ID of CALL has not much been discussed empirically (McLaren, 2010). So far, most of CALL studies have been directed to answer the

efficacy of certain learning tasks and learning activities, such as collaborative works (Chapelle, 2007); to prove efficacy of a particular method of online learning delivery by comparing one method over the others (Reeves, 2011). Given the importance of ID in CALL, this study explores articles on CALL in a decade's period.

Therefore, the aim of the study is to analyse the ID supported by CALL used in the articles reviewed. The predetermined model of typology of ID as the basis for the analysis is further discussed in the Method of Study section. The typology is derived from the characteristics of CALL, namely: delivery of learning materials, learning goal, and roles of computer in CALL.

METHOD

Article Selection

As the purpose of the study is to analyse how CALL is designed, the articles, collected from some online search engines, such as Proquest and EBSCO as well as from Google Scholar, or directly from the journal's website, are CALL-related. Several following key words are used to search for the articles are CALL, web-based learning, and online learning. The articles reviewed are limited to those published between 2003 and 2013.

In selecting the articles for review, the researchers started first by scanning through the abstract before deciding whether a given article was worth for this review. The focus of the articles for this study is the use of CALL to facilitate learning, either in a form of method or strategy of instruction. Articles focusing on development of certain application for CALL are not considered in this study.

The scope of CALL in this study is based on the argument from Levy & Hubbard (2005). They argue that CALL is a generic term in that it covers not only computers in their conventional form but also other forms of ICT products including the network that interconnect individual computers. CALL is an umbrella term for other specific ICT-based second or foreign language instructions. This implies that even if mobile phone is used to mediate foreign language instructions, it is still a CALL as there is some degree of computerness in that Mobile Assisted Language Learning (MALL). In this study, foreign language learning is the focus. So, it is a CALL when the target language is a second or a foreign language (Levy & Hubbard, 2005).

Basis of Analysis

The ID in this context refers to how computer is utilised in supporting the learning activities to achieve certain goal of learning. The design is viewed from three different dimensions. The dimensions are learning content delivery, learning goals, and roles of computer. The three dimensions above characterise the Computer-assisted (language) learning (Collis & Moonen, 2004; Neal & Miller, 2006). Further, each of the dimensions consists of two sub-dimensions. They are content delivery (flexible and limited learning), learning goals (short and long term), and roles of computer (learning tool and learning resource).

Flexible and limited (inflexible) learning are two sub-dimensions from how learning materials are delivered to learners (content delivery). The sub-dimensions derived from the second dimension are characterized by the ease of access from time and place (Felix, 2002). When learning takes place anytime or anywhere or both, the learning is flexible.

Additionally, the second dimension is drawn from the issue on goal of CALL: short and long terms. This dimension shows what to acquire at the end of learning process, namely: knowledge acquisition and meta-skills mastery (Felix, 2005) as well as the mastery of language skills. The characteristic of short term goal of learning is the acquisition of knowledge. On the other hand, long term goal is characterized by the mastery of meta-skills and the target language skills.

Similarly, the roles computer can play are generally divided into two. Such roles are learning tool and learning resource (Collis & Moonen, 2004). A tool will play a role to mediate between learners and the materials. The use of online test is an example of a tool computer plays. On the other hand, the use of Wikipedia as a source of information places Wikipedia as an example of a learning resource.

Eventually, the combination of the three dimensions with their six sub-dimensions forms designs of CALL instruction. The combination results in eight different designs of instruction reflecting the synergy between computer and instruction on which the analysis of the articles was based. The eight different designs are: Flexible-Short-Tool (F-S-T), Flexible-Short-Resource (F-S-R), Flexible-Long-Tool (F-L-T), Flexible-Long-Resource (F-L-R), Limited-Short-Tool (F-S-T), Limited-Short-Resource (L-S-R), Limited-Long-Tool (L-L-T), and Limited-Long-Resource (L-L-R). Table 1 depicts the 8 designs of CALL instruction.

FINDINGS

The findings resulted from 86 out 147 articles retrieved online, show that most of CALL reviewed were designed to utilise computer as learning tools (e.g. Trajtemberg & Yiakoumetti, 2011). On the other hand, only a very small portion of the studies utilised computers as learning resources (e.g. Sockett & Toffoli, 2012).

A goal set for learning in most CALL is very much short term by nature, i.e. the increase of learning achievement, motivation, and confidence as well as to reduce learning anxiety. Only very few studies involve long term goal, i.e. intercultural communicative skills. The following section will discuss the eight designs of instruction used in CALL studies.

Design of CALL Instruction

The synergy between computer and foreign language instruction is seen from the ID in CALL. The ID reveals how computer is positioned within the learning activities and the role it plays in supporting learning and achieving the learning goal. So, by identifying the CALL ID, it can be interpreted the roles computer plays during instruction and the characteristics of learning in order to achieve the learning goal.

Design of instruction 1: Flexible-Short term goal-Tool (F-S-T)

This design involves the synergy of computer serving a role as learning tool in FL instruction to provide learning flexibility in an effort to achieve short term goal(s). In this design, the emphasis is the use of computer as a learning tool, a tool which can be manipulated by human agency for learning to take place.

There are as many as 64% of the articles utilising F-S-T design to achieve various short term goals. The goals set are to increase quality of writing (Kol & Scholnik, 2008); learners' collaboration (Kessler, Bikowski, & Boggs, 2012; Marden, 2007) and learning interaction (Sun & Chang, 2012); vocabulary mastery (Sockett & Toffoli, 2012); understand nonverbal communication acts used in online communication (Wigham & Chanier, 2013); and reveal learners' language choice and identity (Pasfield-Neofitou, 2011).

Two other goals to achieve by using the F-S-T design deal with exploring learners' behaviour in terms of learning anxiety (Roed, 2003) and social presence (Ko, 2012; Satar, 2013).

The learning tools used in the study can be categorised into two on the basis of the function the tool serves, namely: to facilitate communication and to facilitate learning mastery. Synchronous and asynchronous CMC are two common types of online communication used in CALL to facilitate telecollaboration (Antoniadou, 2011; Dooly & Sadler, 2013; Jin, 2013; Peterson, 2012; Vinagre, 2005).

The use of web-based tellecollaborative learning is an example of web as a tool to facilitate learning mastery. The use of this type of tool is more for the teaching of writing (Lee, 2011) and vocabulary (Chan & Liau, 2005)

Design of instruction 2: Flexible-Short term goal-Resource (F-S-R)

From the perspective of computers as learning resources, learners can have privilege to access the resources anywhere and anytime, especially when the resources are stored in online repository or made publicly available. This leads to the F-S-R design. The analysis reveals 20% of the articles dealing with this CALL design.

Most CALL functioning as learning resources focuses on the provision of FLL materials. Learning materials mostly used as learning resources are use of online video which can facilitate language learning (Cross, 2011; Cruz-Yeh, 2005; Johnson & Heffernan, 2006; Lwo & Lin, 2012; Smidt & Hegelheimer, 2004). Other online learning resources mostly used to support language learning is web-based vocabulary and reading materials. Websites serve a function as a repository of learning contents which learner have to access for learning activities. Studies on use of websites as learning contents repository conclusively report positive results in increasing learners' achievement and learning motivation (Chang, 2005; Lan, Sung, & Chang, 2007).

Other forms of learning resources used are utilising self-access centre for catering learners learning autonomy (Hsu, 2005), online learning materials to facilitate independent grammar learning (Heller, 2005; Vincent-Durroux, Poussard, & Lavaur, 2011) and use of online linguistic corpus to help learners improve learners writing skill. The use of online linguistic corpus for helping university students in academic writing (Chang, 2012; Flowerdew, 2012; Yoon, 2008) showed that using online corpus could lead students to be independent learners and produce better quality of writings.

Table 1. Design of CALL Instruction

	Flexible		Limited	
	Short-term Goal	**Long-term Goal**	**Short-term Goal**	**Long-term Goal**
Tool	Flexible-Short-Tool (FST)	Flexible-Long-Tool (FLT)	Limited-Short-Tool (LST)	Limited-Long-Tool (LLT)
Resource	Flexible-Short-Resource (FSR)	Flexible-Long-Resource (FLR)	Limited-Short-Resource (LSR)	Limited-Long-Resource (LLR)

Qualitatively speaking, the results of CALL as learning resources can facilitate language learning especially in terms of reading preferences, learning confidence, learner independence, and motivation.

Table 2. Learning tools used in CALL typology

CALL Design	Learning Tool		References
	Type	**Tool**	
F-S-T	Synchronous CMC:	Text chat	Jin (2013), Dooly and Sadler (2013)
		Video conference	Develotte, Guichon, & Vincent (2010) Antoniadou (2011), Peterson (2012),
		Second life	Wigham and Chanier (2013)
	Asynchronous CMC	Email	Vinagre (2005)
		Discussion forum	Dooly (2011)
	Web-based tool	Web log/Blog	Lee (2011)
		Web-based learning tasks	Chan and Liau (2005
		Wiki	Elola and Oskoz (2010)
		Grammar exercises	Heller (2005), Vincent-Durroux, Poussard, and Lavaur (2011)
F-L-T	Synchronous CMC	Text chat	Simpson (2005)
L-S-T	Synchronous CMC	Text chat	Hamano-Bunce (2010), Smith (2005),
	Asynchronous CMC	Discussion forum	Bratitsis and Kandroudi (2012)
	Computer-based	Tutor	Hirata (2004), Roussel (2011)

Design of instruction 3: Flexible-Long term goal-Tool (F-L-T)

One of the long term effects of computer supported learning is the increase of computer literacy. This computer literacy and the other derived literacies, e.g. digital literacy, Internet literacy, and information literacy is important to support life (Neal & Miller, 2006).

Therefore, designing CALL instruction to support the mastery of ICT related literacies is actually as important as designing CALL instruction to support learning itself. Warschauer (2000) suggests that English should be taught using the new media supported by ICT to develop new identities, such as becoming the new member of virtual communities.

F-L-T design in this study might be not very familiar among CALL practitioners. Only 1% of the articles reviewed utilizes such a design focusing on electronic literacy conducted by Simpson (2005). The study explored the use of synchronous text-based computer mediated communication (SCMC) and concluded that discourse management and knowledge of the technology are characterized by the occurrence of collaboration and knowledge scaffolding.

Design of instruction 4: Limited-Short term goal-Tool (L-S-T)

This design involves use of computer in lab or other facilities without providing time flexibility for learners to access the learning tool via computer. The nature of this learning tool is closed within an intranet system, experimenting observable behaviours which requires strict controls in a lab.

As many as 10% articles rely on L-S-T ID emphasising different focuses of learning in a controlled situation. Included in this L-S-T design are topics dealing with vocabulary mastery (Al-Jarf, 2007; Hirata, 2004); learner online interaction (Bratitsis & Kandroudi, 2012; Hamano-Bunce, 2011; Smith, 2005); learner metacognitive strategy (Roussel, 2011). The studies show positive contribution of ICT either in increasing the learner vocabulary achievement, facilitating communication for online interaction to take place, or providing an opportunity for learners to do reflection.

The learning tools used in this type of design is actually similar to the one used in the F-S-T design: synchronous and asynchronous CMC, as shown in Table 2. The difference lies only on the scheduled time of learners in making interaction online supported by computers.

Table 3. Learning resources used in CALL typology

CALL Design	Learning Resources	References
F-S-R	Online:	
	Online video resources	Cross (2011), Cruz-Yeh (2005), Johnson and Heffernan (2006), Smidt and Hegelheimer (2004)
	Web-based reading resources	Chang (2005), Lan, Sung, and Chang (2007)
L-S-R	Online corpus	Yoon (2008)
	Video animation	Sun and Dong (2004)
	Standalone software packages	Macdonough and Sunitham (2009), Nielson (2011)

Design of instruction 5: Limited-Short term goal-Resource (L-S-R)

As low as 5% of the articles emerge in the data using this L-S-R Call design. One of them is a study by Sun and Dong (2004). The CALL design involved the use of video animation as the learning resource supported with sentence-level translation and a warming up activity in a form of flashcards showing before the animation was played.

Another type of L-S-R CALL which characterized language learning supported by computers in early 2000 is the use of stand-alone computer as a learning resource with pre-installed commercial software on EFL to enable learners to be autonomous EFL learners (Macdonough & Sunitham, 2009; Nielson, 2011). This type of CALL was common in 1990s era up to early 2000 in which computers played a role as tutors replacing instructors. Table 3 describes learning resources used in CALL typology.

The findings above show that five out of eight models appear in the data. They are F-S-T, F-S-R, F-L-T, L-S-T, and L-S-R. Model which do not exist in the data are F-L-R, L-L-T, and L-L-R. The three models absent in the data may be due to the exhaustiveness of the data. The research method also play a role to the CALL ID. For instance, research on CALL has so far been dominated by quantitative paradigm that stays away the design to be long term.

DISCUSSION

What does the F mean in the design?

The findings show that ID beginning with F (F-S-T, F-S-R, and F-L-T) dominates nearly 80% of the studies. This means that foreign language learning integrating computer in its instruction provides a certain degree of flexibility for learners to interact with a learning system.

Among the five dimensions of flexibility for online learning proposed by using Collis & Monnen (2004), only one dimension of learning flexibility emerged in the data. It is dimension of delivery and logistics. It is the flexibility to access the system from anywhere anytime within 24 hours. The other dimensions of flexibility which are absent in the data are time, content, entry requirements, and instructional approach and resources. These other four dimensions as far as data suggest are still beyond the reach of the current CALL.

The other dimensions, such as dimension of time which means learners are flexible to set their time for learning assessment, is unlikely possible to implement as its implementation will compromise a conventional curriculum, especially the academic activities within one calendar year. So, until this point, placing the learner as the centre of learning can only be accommodated by providing flexibility for them to make contacts with their peers and to work out their online tasks, and to a certain degree of flexibility to learn what they want to learn as various online learning resources are available for learners to choose.

Providing other flexibilities to learners, such as flexibility to begin and terminate a course, set their own learning goals, select resources to learn, schedule their own assessment, and time their own pace of learning are still to come in the future. Some pedagogical aspects should support the implementation of those flexibilities, even if those flexibilities should be offered in a single course, if it is possible at all. I just started thinking there would be chaotic situations if all types of flexibilities were offered in a single course.

There is possibility in the future that the implementation of five dimensions of learning flexibility be based on capability of an institution, a department, and a course to afford a certain types of flexibility. Therefore, in the future instead of accommodating all types of flexibility in a single course, there will be selected types of flexibility provided for a single course depending on the target learners, supporting staff and pedagogy, and infrastructure available at an institution.

Tool or resource?

Among the five models of ID emerging in the data, three out of two utilised computer as a learning

tool (F-S-T, F-L-T, and L-S-T). This means that the use of CALL to a certain degree dominantly function to facilitate human agency in in making interaction with the computer. The interactivity is getting smoother as the web 2.0 came into existence in early 2000. By integrating web 2.0 in CALL, learners are facilitated to maintain communication online, collaborate online, and perform self-reflection.

Data show that computer as a tool serves functions to facilitate collaboration and self-reflection. Online collaboration is enabled by way of involving online communication in the ID. This online collaboration enables learners to build personal relationships during online conversation facilitated by the communication tool, such as online messenger.

Finally, as a tool, computer in CALL can be used to facilitate learners' self-reflection. This can be done especially in forms of online task and evaluation. The reflection even will overtly take place if the feedback is promptly provided to learners soon after the evaluation.

Where does CALL lead to in the future?

In the future, the ID of CALL should be able to support either directly or indirectly the development of critical literacy. The critical literacy with its wider practices from its genuine definition shall include being able to make meaning from information available on the internet and thus being able to be critical to the content for the sake of making appropriate decision. Therefore, any single instruction of CALL should be, in relation to critical literacy, designed to facilitate learning environment with practices of criticality.

Additionally, as countries are now virtually borderless, communication among EFL learners of different regions are made possible by the internet forming a virtual global community. CALL with appropriate ID should be able to take the benefit of such virtual community to develop leaners' soft skill: to be competent at working collaboratively with other learners of different locations without being constrained by intercultural communication. Therefore, in this context, besides designing instruction to achieve the target mastery of English as the main goal of learning, instruction should also be designed to develop and practice learners' competence to work together as the additional goal of learning in order to be able to use and create knowledge which is economically valuable, hence, to gain the economic value of the internet.

CONCLUSION

This study reveals that only five out of eight pre-determined models of ID used as a framework emerge in the data. The findings suggest that the emerging five models of the CALL ID put emphasis on the use of computer in terms of flexibility and tool. Flexibility in terms of delivery and logistics dominates the CALL ID which is characterized by the flexibility of the learner to access the system anytime and anywhere. On the other side, positioning computer as a tool in CALL ID has two essential functions for learners: to facilitate collaboration and to initiate self-reflection among leaners.

The shape of future CALL is determined by the need to establish learners' criticality to filter the wealth of information to get the benefit of information from the internet for the sake of gaining its value. In this context, language (English mostly) is not anymore seen as merely an end point for foreign language learners, yet it is an intermediate point to reach other ultimate ends, i.e. to gain the social and economic benefits of the internet. Therefore, CALL ID should be directed to meet such a goal.

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