Web-based Foreign Language Reading: Affective and Productive Outcomes*

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ABSTRACT
This study aimed to investigate whether pedagogically guided web-based reading can improve skimming and scanning significantly (i.e., increased productive outcomes) and whether it can enhance student participation and motivation (i.e., increased affective outcomes). Forty-six students enrolled in two German 3 classes at the high school level were selected. The participants read texts about German culture and politics. Qualitative and quantitative findings indicated that the students in the treatment group (Group A) increased their skimming and scanning performance significantly compared to the students in the control group (Group B). Furthermore, the students in Group A were able to foster their reading skills in such a way that they were able to use it with linear materials as well. Besides skimming and scanning, the students also increased their participation and motivation. Although the participants in Group B made some progress in the following research period, their achievement remained significantly lower than that of the participants in the treatment group. These findings not only make clear that pedagogically guided web-based instruction has a positive impact on foreign language reading skills, participation, and motivation, but they also support the argument that a variety of methods and approaches should be used and that traditional approaches alone should not dominate in foreign language instruction.

KEYWORDS
German, Web-based Reading, Skimming and Scanning, Student Participation and Motivation

INTRODUCTION
Most L2 expert educators and researchers agree that computer-assisted language learning (CALL) can enhance the acquisition of foreign language skills. The use of the web for pedagogically guided authentic foreign language reading is especially widely accepted (Levine, Ferenz, & Reves, 2000; Brandl, 2002). Khan (1997), Hancock (1999), and Gambrell (2005) argue that the web is revolutionizing the acquisition of L2 by giving learners access to an unlimited database of authentic materials. Current documents, papers, virtual books, and even new discoveries from around the world can be accessed. All this corresponds well to the ideal of a foreign language student as researcher and self-directed learner (Lemke, 1998; Calderon-Young, 1999; Kramsch, A’Ness, & Lam, 2000; Bussière, 2004).

In order to take advantage of these sources of authentic materials, databases, and ideas from the foreign culture, students have to use effective reading strategies, such as skimming and scanning, to comprehend L2 texts, or, as Kramsch (1993) points out,

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everyday texts of information require readers to adopt the communicative reading strategies of native speakers: Skim and scan for desired information, capitalize on the natural redundancy of a text and get clues from its context, recognize authorial intention and act upon it. (pp. 177-178)

However, educational practice shows that L2 students often approach paper-based linear texts with ineffective reading strategies, despite their theoretical knowledge about valuable techniques such as skimming and scanning. On the other hand, the nature of nonlinear texts and effective web-based instruction encourages skimming and scanning (Nielsen, 2000). Therefore, it is the aim of this study to investigate whether pedagogically guided web-based reading can improve skimming and scanning significantly and whether it can enhance student participation and motivation.

**Web-based Reading**

Hypertext pioneers like Vannevar Bush (1945, 1967) have already predicted that the usage of information technology would soon redefine the nature of text and reading. In an article in the *Atlantic Monthly* in 1945, Bush prognosticated that electronic text would make it possible to escape the monotonous linear approach of traditional reading. Those electronic texts would allow readers to explore a universe of discourse. Other scholars referred to an electronic hypertext that would interconnect all of the world’s literature, so that researchers, teachers, and students could have immediate access to any of the world’s stored texts in different languages. These thoughts and ideas are becoming commonplace. In most developed countries, the majority of reading on politics, economy, education, and social life takes place on the computer (Castells 1996, 1998; Castells & Catterall, 2001). Although reading on the computer has not replaced books or readers, it is crucial to point out that the computer has already joined them as a major form of literary activity (Warschauer, 1999; Sutherland-Smith, 2002; Blanchard, McLain, & Bartshe, 2005).

However, educators of information technology still have divergent opinions as to whether reading on the screen should be promoted or rejected (Warschauer, 1999). Scholars such as Davis and Lyman-Hager (1997), Sutherland-Smith (2002), Horning (2002), McNabb, Hassel, and Steiner (2002), and Martin (2003) support web-based reading. They argue that electronic texts incorporate broader and more flexible ways to present and access information. Furthermore, Spiro, Feltovich, Jacobson, and Coulson (1995) found that cross-linked hypertext can promote a degree of cognitive flexibility in a field that would otherwise take many years of traditional reading to acquire. In the view of its academic proponents, web-based instruction also facilitates dynamic approaches to reading and fosters critical thinking as well as problem-solving skills (Levine, Ferenz, & Reves, 2002; Horning, 2002; Thompson, Martin, Richards, & Branson, 2003). Students do not just have access to well structured knowledge, but they also encounter content on the web that is ill structured and complex where they have to abstract to higher levels of thinking or may discover multiple ways of evaluating a text. Students further acquire rich semantic networks of information and the ability to structure and restructure new and prior knowledge in activities designed to anticipate the demands of variable and changing situations encountered in the online environment.

Other experts, for instance Talbott (1995) and Campbell (1998), see web-based reading as a major disadvantage in language education, with readers surfing through appealing but often irrelevant materials, never pausing long enough to study specific topics intensively. Campbell (1998) argues that web-based reading might encourage ‘hyperthinking.’ Whereas rational thinkers approach texts in a logical and systematic way, hyperactive thinkers are only
“devoted to stimuli that are novel and eye-catching rather than thought-provoking” (p. 24); they have poor productive and receptive communication skills, a lack of metacognitive abilities and they are unable to handle multiple sources of information.

Although some ideas brought forth by Campbell are too single sided and to a certain extent even inconsistent, it should be taken into account that some of the arguments concerning the use of web-based reading in the classroom as an alternative to traditional instruction are similar to those discussed by other experts. Birkerts (1994), for example, argues that the web could destroy a learner’s ability for deep, reflective reading.

There are also some other problems associated with reading activities on the web. One of the major points of criticism of the use of the web for reading and research purposes lies in the fact that some of the materials on the web are superficial or unreliable (Cerf, 2003; Ricketts & Zakrzewski, 2005). Therefore, Cerf argues that “[w]e truly must think about what we see and hear. We must evaluate and select. We must choose our guides” (p. 7). Spiro et al. (1995) also point out that it is crucial not “to connect everything with everything else” (p. 96) and we have to provide guidance to the students (see also Burke, 2000; Sutherland-Smith, 2002; Forbes, 2004; Krymes, 2005).

Web-based reading differs substantially from traditional classroom instruction. In the traditional classroom, teacher activities often exceed student participation. The teacher largely determines the use of the class time and typically focuses almost all student attention on the textbook (Relan & Gilliani, 1997; Brandl, 2002). In contrast, activities on the web can require a tremendous amount of student activity, and the teacher often just guides students in their efforts, offers feedback to them, and helps them to find solutions. Group projects in which students work in research teams are encouraged. Thus, web-based reading encourages collaboration and serves as a platform for the expression and contribution of cognitive meanings and understandings (Trollope, 1995; Osuna & Meskill, 1998; Kramsch et al., 2000). Thus, the web promotes student-centered interaction. Finnemann (1996) and Brandl (2002) refer to this student-centered nature of the web but also discuss its teacher-centered use in the L2 classroom. Students can appreciate the open-ended system inherent in the web, its virtual cultures, and its nondiscriminatory environment (Finnemann, 1996; Khan, 1997; Owston, 1997; Owston & Wideman, 2001). In addition, instructors can take advantage of the vast library of available materials and information on the web for use for the L2 classroom (Finnemann, 1996; Brandl, 2002). How to take advantage of those materials and how to integrate them into teaching is well explained in Warschauer´s (1997a) guidelines for web-based learning activities. The goals of web-based reading activities should be carefully considered, and online reading activities should be integrated into the course rather than adding them on top of other classroom activities in a disconnected fashion. Furthermore, instructors should not underestimate the complexity of web-based reading and should provide necessary support (Warschauer, 1997a).

**Skimming and Scanning**

Skimming involves searching for main ideas in the foreign language by reading, for example, the first and last paragraphs and noting summaries, conclusions, and suggestions by the author. It is important to teach beginning L2 students this reading technique because otherwise they react by shifting their reading speeds to a very low level, processing material word by word. To master a text in a foreign language, students must thoroughly understand the major ideas and concepts presented.

Scanning is a very effective technique to locate specific information in a text. Scan-
scanning involves running ‘one’s eyes down the page,’ looking for important facts or key aspects. Scanning can also be an aid in locating new terms introduced in a text on a webpage. Unless the students understand new vocabulary and structures, it is impossible to follow the author’s reasoning.

Some scholars such as Nielsen (2000) and Morkes (1997) argue that skimming and scanning are most natural to the web, and webpages are often designed accordingly. However, it can also be argued that this is not always the case because skimming and scanning has more to do with the genre of a text and with the reading tasks and aims than the medium in which the text is presented. There is little point in skimming and scanning Goethe’s *Faust*, even if it is placed on the web. However, when it is a question of specific texts on culture, politics, or economic affairs, which are usually packed with many facts and also unimportant details, the use of skimming and scanning becomes crucial.

Nevertheless, Nielsen’s (2000) findings shed some light on the issue of the naturalness of skimming and scanning on the web. First, it should be noted that we rarely find dramas and entire novels on the web, but the web does contain a lot of information on German culture, politics, and so forth. Thus, there is a much better selection on the web than in the textbooks or other books available for use in the classroom when it comes to materials that lend themselves to the development of scanning and skimming skills. Second, it is easier to find materials related to a given topic on the web (e.g., by means of links or search engines), allowing users to read a webpage written in a simpler version of the target language before working on a more challenging webpage. Third, a lot of young people spend more of their leisure time reading materials on the web than reading books. Working on reading techniques in an environment that is similar to that of their leisure time activities can be an advantage. In addition, the availability of authentic materials and choice of texts make learning activities more interesting (Burke, 2001; Blanchard, McLain, & Bartshe, 2005).

**The Role of Motivation and Participation**

Many researchers argue that there is a need to reexamine the relationship of motivation and web-based reading (Davis & Lyman-Hager, 1997; Kramarski & Feldman, 2000) because most of the previous studies are outdated or they are too general (Song, 2000; Chen & McGrath, 2003). Furthermore, it is also evident that the importance of affective factors with respect to computer-assisted reading has been underestimated in the past (Keller, 1999; Rosalia, 2002). However, web-based foreign language learning involves a variety of psychological, social, and cognitive factors which have a significant impact on student learning and achievement (Warschauer, 1996). Accordingly, there is a need to examine “specific aspects of computer-assisted language learning and student motivation” (Warschauer 1996, p. 29) and their interrelationships. It is one of the goals of this study to extend previous research and investigate the nature of participation and motivation in connection to skimming and scanning through correlational and experimental approaches.

**Statement of the Problem**

The major research question of whether web-based reading promotes effective strategies such as skimming and scanning has not been previously investigated. In this study, all students read linear (i.e., paper-based) texts in the course textbook and a reader, and the participants in the treatment group also read some web-based texts. In addition, all students received instruction in the use of reading strategies. Even though the students received reading strategy
instruction, the majority of them continued to try to translate the linear (paper-based) texts word by word. They often forgot what they had read in the beginning and did not have time to finish even half of the assignment. Therefore, the level of reading comprehension was low, concepts and general meaning were not always understood, and detailed questions were not answered in many cases.

It is the aim of this study to investigate the effect of web-based reading combined with an effective instruction on students’ skimming and scanning skills. It is hypothesized that foreign language students who work with linear (paper-based texts) and nonlinear texts (web-based texts) will score significantly higher on measures of skimming and scanning than those who work with linear texts only. It is further hypothesized that there will be significant positive relationships among skimming, scanning, participation, and motivation for beginning foreign language students who work with linear and nonlinear texts and those who work with linear texts only.

1. How do students who work with both linear and nonlinear texts react to the nonlinearity of texts on the web?
2. a) Do students focus more on general meaning or unnecessary details when reading nonlinear or linear texts?
   b) Do they use skimming and scanning more often in nonlinear or in linear texts?
   c) What is their opinion about the level of difficulty of German materials on the web?
3. What influences does web-based reading have on students’ participation and motivation, especially their motivation to read German materials during leisure time?
4. Is there a significant difference in skimming and scanning between the students who work with both linear and nonlinear texts and those who work with linear texts only in the research-in-progress and end-of-research period?
5. Are there correlations between: (a) skimming and participation, (b) skimming and motivation, (c) scanning and participation, and (d) scanning and motivation in students who work with nonlinear and linear texts and those who work with linear texts only at the end-of-research period?

PARTICIPANTS, METHODS, AND PROCEDURES

In connection with the qualitative and quantitative orientation of this semester long project, a variety of research methods was used to collect data. The major focus of these data collections was the observation and study of the participants who read both linear and nonlinear texts (Group A) and those who read linear texts only (Group B) with a focus on skimming and scanning.

The participants in this study were 46 students enrolled in two German 3 classes at the high school level. The students in one class were assigned to Group A, and the students in the other class were assigned to Group B. Prerequisite to this German 3 class was German 2 or an equivalent German language background. All participants had at least basic computer skills,
which were measured prior to this study (see background questionnaire in Appendix A). The participants read German fairy tales and texts about German culture and politics. They had a choice of several texts in these three genres.

The students in Group A worked with nonlinear and linear texts. They used their textbook, Komm mit, and websites such as Logo-Kindernachrichten, Spiegel-Online with the rubrics Politik, Kultur, and Wissenschaft (related to culture, politics, and human relations only) (http://www.spiegel.de), Das Politische System der Bundesrepublik Deutschland (http://www.hkbu.edu.hk/~europe/polshyp/run.htm), and Regionalpolitikseite der Europäischen Kommission (http://ec.europa.eu/regional_policy/index_de.htm).

The students in Group B read linear texts only. They used their textbook, Komm mit, and a reader. The students in each group always worked in pairs. Both classes had the same instructor. Finally, all students had a similar achievement level in German, and there were no significant differences between the groups prior to this study.

In the preresearch period, background information was collected on the participants’ basic language skills, reading performance, computer experience, and level of motivation via a paper-based questionnaire. The background questionnaire was distributed to all participants who were requested to complete and return it prior to taking part in the research project. In addition, the participants’ latest L2 reading achievement in skimming and scanning and their level of motivation and participation during the performance of the reading task were measured and analyzed. The students’ reading performance and participation was graded by the teacher and measured in scores from 100 to 0 (i.e., 100 to 90 = A, 89 to 80 = B, etc.). Student motivation was rated by the participants themselves and also measured in scores from 100 to 0 (i.e., 100 to 90 = very high, 89 to 80 = high, etc.).

Data on student reading performance and participation were also obtained through direct observation and classroom recording (all students were recorded during each session), several interviews, questionnaires, and reading tests regarding their ability to skim and scan texts during the research-in-progress and the end-of-research period. The students were recorded (audio and video) while reading linear texts in the textbook or reader. Attention was paid to their reading performance and affective outcomes. All participants worked in pairs and used the “pair-talk-aloud” strategy (one group consisted of three participants). The pair talk-aloud protocol differs from the think-aloud protocol (Krymes, 2005) because “it is derived from a discussion rather than from the subjects being asked to verbalize their thoughts” (Trollope, 1995, p. 15). In addition to the video recording of the reading approaches (i.e., skimming and scanning), a microphone with video sound mixing was used to facilitate simultaneous recording of the participants’ talk onto the videotape. Altogether, the recording procedures allowed the researcher to collect substantial amounts of data from the talk-aloud protocols that reflected the students’ reactions.

While the students in Group A were engaged in the reading of nonlinear texts on the web, the researcher used video-capturing software to record the texts they were reading. It was therefore possible to observe what the participants had displayed on their computer screens and to take note of their reaction to the texts in a hypertext environment. The videotaped pairs of participants were asked to use the “pair-talk-aloud” strategy to describe what they were doing at the particular moment and what their overall task was.

Student interviews and a questionnaire were used at the end of the project to collect supplementary data. The interview questions and questionnaire items focused on the following aspects:
1. self-evaluation (i.e., level of participation, motivation, skimming, and scanning);
2. students’ focus on general meaning of texts or on unnecessary details in the texts; and
3. (Group A only) students’ skimming and scanning of German texts on the web versus their approach to linear texts in the textbook/reader, their opinion on the level of difficulty of German texts on the web versus those in the textbook/reader linear texts, their preference for linear or nonlinear texts.

During the research-in-progress and the end-of-research period L2 reading performance was tested again. Participation and motivation data were also analyzed. In addition to introspective data, posttask data were also collected in order to implement additional features. Mertens (2005) argues that posttask retrospection is very important because it serves as a means of further investigating and clarifying crucial findings. The posttask research was completed after finishing the research project (i.e., during the last week of the semester).

DATA ANALYSIS
All interviews, observation notes, talk-aloud protocols, and recordings were transcribed and analyzed through discourse analysis. The questionnaire data were used to supplement the qualitative findings obtained during the classroom observations in all research periods. Qualitative and quantitative data were always evaluated according to the next higher attainment levels. This means that an increase in the use of a particular reading technique reflects not merely progress with respect to previous results but also an increase with respect to higher academic demands set for the research-in-progress and end-of-research periods.

Information from the questionnaire items and interviews (all research periods) was analyzed in a descriptive way. The pretask, research-in-progress, and end-of-research data regarding the participants’ achievement were analyzed by Chi-square and Fisher’s Exact Test. Both tests were used to compare the achievement levels between the groups in order to explore any differences between Group A and B.

The end-of-research period data concerning the relationship of the variables skimming-motivation, skimming-participation, scanning-motivation, and so on within each research group were computed through correlation and regression analysis.

FINDINGS
Prior to this research study, the participants in both groups tended to focus more on unnecessary details than on the general meaning of given texts. There were no significant differences between these groups (Fisher’s two-sided test = .722; see Appendix B). The majority of the students had difficulties in acquiring the overall gist and context of their assignments. However, in the research-in-progress period the students in Group A already started to focus more on the general meaning when reading materials on the web. Classroom observations and tests supported this fact. During the research-in-progress period 15 out of 23 students in Group A were able to comprehend the general meaning of texts compared to 9 out of 23 students in Group B. However, there still was no significant difference between the groups.
(Chi-square = 3.14, \( p = .076 \), Fisher’s two-sided test = .139; see Appendix B). However, during the end-of-research period, Chi-square analysis showed a significant difference in the performance between the groups (Chi-square = 5.25, \( p = .022 \)). Fisher’s Exact Test showed that the students in Group A outperformed those in Group B (i.e., left-sided Pr <= F = .996; right-sided Pr >= = F .024 with a Table Probability P = .020).

The semester long observation of Group A revealed that, when reading web-based materials, they tended to focus more on general meaning (skimming) than on unnecessary details and on finding particular information (scanning). Throughout this study the results of this group with regards to skimming and scanning increased to a higher degree than those of the students in Group B. In the end-of-research period there was a significant difference between the groups: Chi-square = 11.82 (\( p = .037 \)) for skimming and Chi-square = 12.13 (\( p = .033 \)) for scanning (see Appendix C). Seventeen students in Group A and 9 students in Group B achieved excellent, very good, and good results in skimming. The only students with poor results were those in Group B. With respect to scanning, 19 students in group A achieved excellent, very good, and good results compared to 11 students in group B. Furthermore, 7 students in Group B had scanning scores slightly below average or even very poor results, but no one in Group A had a scanning performance below average.

The positive test results in Group A were also supported by interviews with the participants. When asked about reading materials on the web during the research-in-progress period, 15 students in Group A indicated that they were using skimming and scanning more effectively and to a larger extent. Only 3 students stated that they used skimming and scanning more often in linear texts, and 5 students noted no difference at all (see chart in Appendix D). Expressions coded as “skimming and scanning” included processes such as getting the gist, figuring out the overall meaning, getting the general idea, and finding particular information.

Interviews with participants in Group A lend credence to these findings.

Student 1: I definitely use skimming and scanning more often ... . I also ... mm ... focus more on general meaning than on details and on finding particular information that is relevant to a question.

Student 2: When I ..., for example, ... read something about the Green Party in German, there were always a lot of things I didn’t understand but ... I got the gist of it on the web because of statistics and visuals on the internet ... and helpful links ... .

Student 3: I am kind of used to it ... I often skim and scan ... on the internet.

These sample statements show that students indeed skim and scan more often for information in nonlinear texts. Most of the students in Group A also indicated that they always approached web assignments with a higher level of encouragement than other assignments. They found web exercises as an addition to other, more traditional exercises more motivating, and they developed a very open attitude towards German as a foreign language.

It was also interesting to find out that the students in Group A generally preferred to do their skimming tasks first (see transcript extract below). They affirmed that it was very important to them to understand the gist of a text at first and then seek specific details and key phrases by scanning.
Sample Transcript (Group A Students)
(The tasks preceding task 4 focused on scanning. Task 4 focused on skimming.)
Task 4

Transcript

E(3): We should ... mmm ... wir machen task four zuerst ...
'... mmm ... we do task four first ...'

F(4): ist gut, wenn man den gist kennt!
'Yes, it is good if you know the gist.'

E(5): Hmm, ... die Grünen sind durchaus eine wichtige Partei im Landtag und Bundestag ... und sie setzen sich nicht nur für eine saubere Umwelt ein ...
'Hmm, ... the Green Party is an important party in the Landtag and Bundestag ... and they support not only a clean environment ...'

F(6): ... ja, sie setzen sich für demokratische Politik ein. In der Partei ... mhm ... Look! ... da sind Demokraten, Feministen und Umweltrechtler ... mhm ...
'... yes, they support democratic politics. In the party ... mhm ... Look! ... there are democrats, feminists, and environmentalists ... mhm ...'

F(8): Ach so! ... Sieh mal ... eine wichtige politische Aufgabe der Grünen ist neben der Umwelt die Beschäftigungs-politik und Aktionen gegen Korruption und Misswirtschaft.
'I see! ... Look here ... a very important task of the Greens, besides the environment, are issues of employment and actions against corruption and mismanagement.'

E(9): Richtig ... "und die Grünen fordern den europaweiten Eintritt in die Sozial-und Umweltunion."
'Right ... 'and the Green Party wants a Europe wide membership into a social- and environmental union.''

F(10): und sie fordern eine Progression in der wirtschaftlichen Integration Europas.
'and they want a progression of the economic integration of Europe.'

Working on their skimming task, 20 out of 23 students in Group A did not focus on single words or phrases only, in contrast to the bottom-up reading strategies used by almost half of the students in Group B. It would seem that those who used bottom-up strategies felt no responsibility for processing a text other than that of extracting word level information from the text, without understanding the context of the text. Group A predominantly used top-down strategies, characterized by recognition, initiation, and comprehension. With regard to scanning, the majority of the students in Group A used top-down and bottom-up strategies in an interactive way. This interactive approach allowed for a broad and differential use of information sources under different circumstances. Furthermore, interactive processing was
also compensatory such that when students encountered a failure in the use of one strategy, they used the other strategy to continue processing the text. The extract below illustrates how students followed an interactive approach.

Sample Transcript (Group A Students)

Transcript

C(3): "Frankfurt am Main ist Deutschlands Finanzmetropole"… und hier … hmm, … "In Frankfurts Skyline sitzen nicht nur deutsche Banken, sondern viele ausländische Firmen, … .”

"Frankfurt/Main is the financial metropolis of Germany' … and here … hmm, … 'Frankfurt’s skyline is not only made up of German banks but also of many foreign companies, … .”

D(4): … Richtig … und in den anderen paragraphs geht es um die Kulturgeschichte der Stadt und wichtige Personen …

‘… Right … and in the other paragraphs attention is paid to the cultural history of the city and to important people … .' 

C(5): … ummm, und wichtige Personen als auch das Finanzleben der Stadt sind our Skimming-Tasks.

‘... ummm, and important people as well as the business/financial life of the city are our skimming tasks.’

D(6): Mmm … but do you understand this paragraph? Ja? …

C(7): Das ist wirklich schwer. Ich denke, wenn wir die spezifische Informationen danach verstehen … ist es okay und we can machen some connections here.

‘That is really difficult. I think if we understand the specific information following this part….it is okay and we can make some connections here.’

During the end-of-research period, most participants in Group A were able to use their skimming and scanning skills with linear texts as well. Compared to Group B, however, they did not use the dictionary as often and would work with a higher quality and quantity of foreign language and L2 reading skills. They also took advantage of the web glossary and hints on the webpage in order to understand the gist of a text. Although the students engaged in some code switching when they encountered difficult words or phrases, they consistently performed skimming and scanning tasks in German. Within this process, they appreciated the interactive, student-centered, and collaborative approaches that informed their reading (see also Schmar-Dobler, 2003; Leino, Linnakylä, & Malin, 2004).

Group A generally felt more relaxed when reading German materials with a higher level of difficulty on the internet than in a book, as indicated in the following interview excerpt:

Student: Um, … I really felt more relaxed when reading German texts from the world wide web. When I was looking at the websites, it was like … "Wow, there are plenty of pages in German,” and … I was never nervous and scared and did not always think: … "Well, am I going to
understand the German materials?” Mm, to some degree I felt like a
researcher and this made everything more exciting ... Umm, I have
definitely learned a lot, without asking for the meaning of every single
word.

The students were very interested in authentic L2 materials on the web, and they were
even encouraged enough to do extra readings (see also Trend, 2001). Approaching and un-
derstanding L2 reading materials on the web seemed to be easier because they were highly
motivated and significantly increased their level of participation. Indeed, the majority of
the students in Group A stood in contrast to the number of students in Group B who were moti-
vated to read German materials in their leisure time. After the first 3 months of the study, 19
participants in Group A reported a high or even very high motivation to read German texts
at home. This was the case in only 4 participants in Group B. In the latter group, 10 students
hardly read anything in the target language and 4 students were not at all motivated to read
in German. They declared that they used their textbook at school all the time and that there
was no point in going over those texts again at home. The other 4 students who read German
materials in their free time used the web as well. There was a significant difference in motiva-
tion between the groups (Chi-square = 24.03, $p < .0001$; see Appendix E).

The participants in Group A stated that the following aspects had a positive impact on
their overall motivation and willingness to do even extra work in German:

1. The student as researcher and investigator
   The students were always curious to find something out about German cul-
ture and politics and were able to conduct research on these topics. The
participants also appreciated the opportunity to share their findings after-
wards in the classroom.

2. Responsibility and independence while making decisions about the reading
topic
   The students were able to select what to read from a variety of cultural and
political materials. In a textbook this option is often not given.

3. Positive attitude towards modern technology
   The interest in new technology, the ease of use of the web and the ad-
vantages for foreign language learning through various computer-assisted
techniques that do not just concentrate on abstract-logical approaches but
also on concrete visual aspects enhanced the students’ motivation and will-
ingness to read German materials on the web in their free time.

4. Access to texts in the target language
   Authentic German texts were easily accessed. In addition, the participants
were able to consult experts in Germany when they had further questions.

5. Multiple resources
   While engaged in reading L2 texts, the participants did not have to rely on
only the advice and help of the instructor. The students had an unlimited
access to online resources, for example, new research and developments in
German politics. This enhanced the L2 learning process and general educa-
tion. It also set wider perspectives in the area of academic reading.
6. Authenticity
Access to contemporary authentic materials engaged the students in reading about topics of interest to them, thus making them even more motivated to engage in other L2 reading projects.

7. Learning beyond a linearly structured educational setting
Because web-based reading extended the boundaries of learning beyond a particular educational setting, the participants were highly motivated to explore German culture and politics on their own through various computer-assisted approaches even outside the classroom.

8. Enhanced feedback
The students received L2 expert educator feedback by contacting the author/coauthors or publishers and asking them for explanations on their articles about culture and politics. This was very easy in the online-environment because texts in journals; for example, Spiegel-Online (http://www.spiegel.de) not only provides information on the author(s) but also invites readers to ask questions and provide feedback. Even though the students in Group B also received feedback from experts, options were often very limited; most of them did not think about contacting authors, or it simply was not possible to reach them because their contact information was not available.

9. Individual interests addressed in specific German texts
In linear texts attention is often focused on certain cultural texts (often traditional and not very current) and German literature. However, many students were also interested in scientific, political, and other texts in German on the web (e.g., research articles). New research articles or reports gave wider perspectives for reading for information in German. This was a tremendous advantage.

The quantitative research results also revealed a direct positive interrelationship among motivation, participation, skimming, and scanning. An increase in the level of one variable was accompanied by an increase in the value of the other variables, and a low value of one variable was accompanied by a low value in the other variables. Correlation coefficients between .846 and .994 for motivation, participation, skimming, and scanning in Group A and between .754 and .995 for these variables in Group B indicated strong positive interrelationships among all the variables. Thus, there was a direct positive relationship between productive and affective outcomes.

The interrelationship between affective and productive variables indicated that the nonlinear environment of the web was not the only factor contributing to an increase in reading skills. Rather it is important to recognize the specific impact of motivation, participation, and age-related factors. Analysis of the data from the background questionnaire, which was given to all participants prior to taking part in this study, revealed that the students used the internet much more for reading purposes than books. The participants spent 24 to 28 hours per week reading texts on the internet in their native language but only 14-16 hours reading books. They enjoyed reading on the web in their native language, and they also argued that it is more exciting to have a wide variety of texts available to them on the web. The participants further referred to the high relevance of selected web-based material and its authenticity. Thus, it was an advantage to use a medium that appealed to the students and, in addition, to allow for different teaching techniques. Indeed, web-based reading was very natural to them and likely had a substantial impact on their level of motivation in the study. Motivation
is involved in the performance of all learned processes; that is, a learned skill will not be used unless it is energized. This was the case when it came to reading linear texts in the beginning of the study. As pointed out above, the students knew the reading techniques, but most of them were not able to use them efficiently and appropriately when reading linear texts. However, in the nonlinear environment they showed a higher level of participation and motivation. These affective factors in turn had a positive impact on skimming and scanning results (see Verhoeven & Snow, 2001; Alderman, 2004; Radden & Panther, 2004; Elliott, 2005).

Age-related factors (i.e., students as members of an internet generation) and students’ interests also figured into the context of the study. Participants in another age group or with different interests would likely lead to different outcomes. It is possible that a linear approach to reading is more useful in those settings, at least in the beginning. For example, even in the study described here, a few students in Group A stated that they preferred reading exercises in their textbooks. The students learned in different ways and used different modalities to apply reading skills and take in information from texts. In order to meet these needs, the teacher had to use a variety of strategies and methods. The participants had to learn to apply their knowledge in different ways—on the web and in the textbook—because both are of importance in their academic and social life.

CONCLUSIONS
This study showed that pedagogically guided web-based reading instruction had a significant impact on the increase of the participants’ L2 reading performance with respect to skimming and scanning.

Qualitative findings indicated that glossaries, links, graphs, charts, search engines, and so on in nonlinear texts supported the students’ skimming and scanning skills. Most students focused on general meaning when reading materials on the web and tended to focus on details when reading materials in textbook and reader. Through the acquisition and effective usage of skimming in the nonlinear environment, the students in Group A were also able to make use of these reading skills with linear materials as well.

Features such as access to texts in the target language, authenticity, multiple resources, enhanced feedback, learning beyond a linearly structured educational setting, interdependence and responsibility, working as a researcher, a positive attitude to modern technology, and the wide variety of texts available in fields that reflected students’ interests influenced their reading skills in a positive way and also their participation and motivation.

Qualitative results were supported by quantitative results. Group comparisons indicated a significant improvement in skimming and scanning skills by students in Group A (reading both linear and nonlinear texts) compared to those in Group B (reading linear texts only). This finding shows not only that web-based reading has a positive impact on L2 reading skills but also that a variety of different methods and approaches can be profitably used in the L2 classroom and offers significant advantages over traditional approaches alone.

A very important finding is the interrelationships among L2 reading skills, participation, and motivation. The increase of one (e.g., skimming) was accompanied by an increase in another variable (e.g., participation) and vice versa. Skimming, scanning, motivation, and participation can be significantly influenced through appropriate reading techniques. However, when choosing teaching methods and reading materials, the instructor should be also aware of differences among students and their different learning preferences.
REFERENCES


APPENDIX A
Background Questionnaire Data

Biographical data
a) Age: Group A: 2 students = 16; 14 students = 17; 7 students = 18
   Group B: 17 students = 17; 6 students = 18
b) Education: Group A: 2 sophomores; 12 juniors, 9 seniors
   Group B: 1 sophomore; 15 juniors, 7 seniors
c) Traveling experience:
   Group A: 7 students have been to Germany, Austria, and Switzerland for vacation. 3 students took a language course in one of these countries.
   Group B: 8 students have been to Germany, Austria, and Switzerland on a language and culture program. 4 students have been on vacation in Germany, Austria, Switzerland, Belgium, and Liechtenstein.

L1 and L2 background information
a) Native language(s):
   Group A: 19 students = English; 4 students = bilingual in Spanish/English
   Group B: 20 students = English; 2 students = bilingual in Spanish/English, 1 student = bilingual in Chinese/English
b) Are you bilingual? Which other language/languages do you speak in a native-like way?
   Group A: 4 students = bilingual; 23 students = German as a foreign language
   Group B: 3 students = bilingual; 23 students = German as a foreign language; 2 students = also Spanish as a foreign language
c) When did you start to learn German?
   Group A: 2 students at middle school level; 21 students at high school level
   Group B: All students at high school level
d) Ability to read texts in German (skimming, scanning-self evaluation):
   Group A: Very high: 4 students; High: 2; Average: 8; Low: 9
   Group B: Very high: 2 students; High: 7; Average: 7; Low: 7
Computer experience, reading, and motivation

a) Do you have (1) no computer skills, (2) limited computer skills (3) basic computer skills, or (4) advanced computer skills? Basic computer skills include the successful use of Word and the use of the Internet, including the work with search engines.

Group A: No computer skills: 0; limited computer skills: 0; basic computer skills: 12; advanced computer skills: 11
Group B: No computer skills: 0; limited computer skills: 0; basic computer skills: 14; advanced computer skills: 9

b) How often do you read texts in books/ newspapers or on the web during a week?

Group A: Mean: 14 hours (books, usually school textbooks)
        Mean: 28 hours (internet at home and at school; texts but also emails)

Group B: Mean: 16 hours (books, usually school textbooks)
        Mean: 24 hours (internet at home and at school; texts but also emails)

c) Rate your level of motivation to read German materials in your textbooks at school (use of skimming and scanning):

Groups A: Very high: 2; high: 3; average: 6; less: 10; no motivation: 2
Groups B: Very high: 2; high: 3; average: 8; less: 9; no motivation: 1

d) Do you prefer reading texts in your textbook or on the Internet? Why?

Group A: Textbook: 5; Internet: 18
Group B: Textbook: 8; Internet: 15

Textbook: (1) can go over the readings at home (textbook available, Internet not always); (2) problems with working on a computer for hours; (3) can ask siblings for help because they had to read the same texts; (4) always available—they can read in the school bus or in the car if they have to

Internet: (1) better materials; (2) authentic texts; (3) relevant to everyday life (textbook not because it is a couple of years old); (4) work at school and at home; (5) wide variety of texts; (6) difficult and easier texts (serves different students)

APPENDIX B
Focus on General Meaning Versus Focus on Unnecessary Details

<table>
<thead>
<tr>
<th>Prereasearch period</th>
<th>General meaning</th>
<th>Unnecessary details</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Group A (n = 23)</td>
<td>4 (8.7%)</td>
<td>19 (41.3%)</td>
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<td>6 (13.0%)</td>
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<td>Total</td>
<td>10 (21.7%)</td>
<td>36 (78.3%)</td>
<td>46 (100%)</td>
</tr>
</tbody>
</table>

Chi-square = 0.51 (p = .475)
Fisher's Exact Test

| Cell (1, 1) Frequency (F) | 4 |
| Left-sided Pr <= F | .361 |
| Right-sided Pr >= F | .858 |
| Table probability (P) | .219 |
| Two-sided Pr <= P | .722 |

Research in progress

<table>
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<th>Unnecessary details</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Group A (n = 23)</td>
<td>15 (32.6%)</td>
<td>8 (17.4%)</td>
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</tr>
<tr>
<td>Group B (n = 23)</td>
<td>9 (16.6%)</td>
<td>14 (30.4%)</td>
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<tr>
<td>Total</td>
<td>24 (52.2%)</td>
<td>22 (47.8%)</td>
<td>46 (100%)</td>
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</table>

Chi-square = 3.14 (p = .077)

Fisher's Exact Test

| Cell (1, 1) Frequency (F) | 15 |
| Left-sided Pr <= F        | .981 |
| Right-sided Pr >= F       | .070 |
| Table probability (P)     | .051 |
| Two-sided Pr <= P         | .139 |

End of research

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<td>20 (43.5%)</td>
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<td>Group B (n = 23)</td>
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<td>23 (50%)</td>
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Chi-square = 5.25 (p = .022)

Fisher's Exact Test

| Cell (1, 1) Frequency (F) | 20 |
| Left-sided Pr <= F        | .996 |
| Right-sided Pr >= F       | .024 |
| Table probability (P)     | .020 |
| Two-sided Pr <= P         | .047 |
APPENDIX C
Skimming and Scanning

End of research: Skimming

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<th>Below average</th>
<th>Poor</th>
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<tr>
<td>Group B</td>
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<td>0 (13.0%)</td>
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<td>4 (8.7%)</td>
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<td>9 (19.7%)</td>
<td>11 (23.9%)</td>
<td>7 (15.2%)</td>
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Chi-square = 11.82 (p = .037)

End of research: Scanning

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<th>Poor</th>
<th>Total</th>
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<tbody>
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<td>8 (17.4%)</td>
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<tr>
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<td>3 (6.2%)</td>
<td>7 (15.2%)</td>
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<td>13 (28.3%)</td>
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<td>3 (6.5%)</td>
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<td>46 (100%)</td>
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Chi-square = 12.13 (p = .033)

APPENDIX D
Use of Skimming and Scanning While Reading Linear and Nonlinear Texts (Group A Students Only)

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APPENDIX E
Students' Motivation to Read German Texts in Their Free Time

Preresearch: Motivation to read

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</tr>
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<tbody>
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<td>3 (6.5%)</td>
<td>11 (23.9%)</td>
<td>5 (10.9%)</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Group B</td>
<td>3 (6.5%)</td>
<td>2 (4.3%)</td>
<td>4 (8.7%)</td>
<td>9 (19.6%)</td>
<td>5 (10.9%)</td>
<td>23 (50%)</td>
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<td>(n = 23)</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>4 (8.7%)</td>
<td>5 (10.9%)</td>
<td>7 (15.2%)</td>
<td>20 (43.5%)</td>
<td>10 (21.7%)</td>
<td>46 (100%)</td>
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</table>

Chi-square = 1.54 ($p = .819$)

Research in progress: Motivation to read

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<tr>
<td>Group B</td>
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<td>2 (4.3%)</td>
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<tr>
<td>Total</td>
<td>9 (19.6%)</td>
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<td>46 (100%)</td>
</tr>
</tbody>
</table>

Chi-square = 24.03 ($p < .0001$)

AUTHOR’S BIODATA

Dr. Kerstin Lück is a lecturer and researcher at the University of California, Davis. Her research interests include social, cultural, and linguistic aspects in education, diversity and justice education, and identity construction of immigrants.

AUTHOR’S ADDRESS

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