

# Developing Autonomous Second Language Learners in a Content Class

Nancy Fahnestock

**Abstract** This paper describes a small-scale study which attempts to develop more autonomous second language (L2) learners in a content class, with the use of an interactive tool called ALEKS. ALEKS is an online version of math curriculum ranging from elementary to higher level calculus classes and is readily available to schools and colleges throughout the world. In this study, I used the curriculum for Foundations Level Math students in year one in college. The student's overall satisfaction was measured using questionnaires. After a brief investigation of student autonomy within the Arabic culture, a discussion will follow regarding learner awareness and self-evaluation and the overall success of this tool for this particular population of students. The dilemma over whether this is merely another tool for the traditional classroom or if understanding is truly enhanced using this pedagogical approach, thus creating more autonomous learners, will ultimately be answered.

**Contents** 1. Rationale for the Study. — 2. Background on Students and Institution. — 2.1. The Institution. — 2.2. The Students. — 3. The ALEKS Program. — 4. Methodology. — 5. Findings. — 6. Conclusion.

## 1 Rationale for the Study

The emergence of technology and its significant capital costs in classrooms have had a great impact on traditional pedagogical methods. These important changes have created a need to determine whether or not a program like ALEKS (<http://www.aleks.com/>) can provide a useful alternative to teaching content in L2. The interactive tool ALEKS was selected as a potential effective alternative method of teaching content in L2 with native Arabic speaking students. The interactive component of ALEKS provides students with immediate feedback and offers suggestions as to what further steps to take, all uniquely designed for each individual student. Students can access this online program any time they have Internet access. In recent literature, Briggs and Keyek-Franssen (2009) suggested that students benefit as they progress through a program when ongoing formative assessments focused on the individual needs of the students. The ALEKS program provided these very opportunities. The aim of the study was to explore alternative methods of teaching, which would ultimately assist students in their transition from habitual rote learning to critical think-

ing and problem solving. Further, it was desirable to create changes in the student's learning methods by helping them recognize their metacognitive skills and identify which individual concepts needed further work, all in order to create more autonomous learners. It was hoped that the additional interactivity of the ALEKS program would increase student interest, independence and ultimately, success. Further, if they were to develop these more autonomous skills, this would better prepare the students to handle a higher-level math class. Given that students who enter tertiary education in the Foundations Program have not necessarily had a positive experience in math according to Beilock (2010), it was hoped that, over time, the negative feelings could be replaced by more positive ones. Further, it was hoped that as the students spent more time working to progress through the program, they would recognize the correlation between improved marks and amount of time spent studying. It was also anticipated that as the students began to use their mistakes as learning tools, their learning experience could become more meaningful and behaviors would become more positive and conducive to learning. This process could pave the way to becoming more autonomous learners in math, and in other aspects of their educational career. Because the learning for these students would become individualized, it would allow for those with higher skill levels to advance while not being held back by those who were weaker in the content. Consequently, it was assumed that if the experience for students was improved, teachers' pedagogical experience would also benefit and lead to educational efficacy for all. This practice followed a pilot study by the same math team who worked on two separate math programs. The idea was to determine which of the many online programs available best suited this particular population of students. It was ultimately decided that ALEKS, although still not ideal, met more of their needs and was preferred by more of the students and faculty as well. There were issues with the program; for example the use of low frequency words was a potential problem. Once the probable concerns were realized however, their teachers addressed them during brief teacher-centered presentations, which allowed the teachers to supplement the missing components. These issues were minor and were mostly outweighed by the many benefits the program offered, the main benefit being that it provided opportunities for the students to work on their mental exercises, all the while learning new content.

## 2 Background on Students and Institution

### 2.1 The Institution

This women's college is part of a chain of seventeen federal technical colleges established in 1988 in the United Arab Emirates (UAE). It is a

government-funded tertiary institution with approximately 1 600 students and 85 full-time faculty members. His Excellency, Sheikh Nayahan Mabarak Al Nayahan, said in the opening address at the beginning of the 2012 academic year:

We support learning by doing. Our commitment to the use of educational technology is undiminished. We are committed to developing a rich learning environment that offers opportunities to engage in independent and group learning.

Only UAE high school graduates are allowed to attend and, at this particular institution, the higher-level programs make up approximately 50 percent of enrollment while the other 50 percent are enrolled in the Foundations Program. Currently, these figures are changing as the colleges are increasingly moving towards Liberal Studies and away from Foundations Programs; however, the demand to offer the fundamentals remains strong, as there is sufficient need.

## 2.2 The Students

In 2005 the UAE set about national educational reform. MacPherson et al. (2007) suggest that the educational system at that time was ineffective with unsuitable curricula and limited class time with students only spending about half the time in school compared to that in other countries. Rote memorization with few attempts to problem solve was the norm. Marton (1975) and Entwistle and Marsden (1983) refer to this type of learning as ‘surface’ learning in contrast to ‘deep’ learning, where the focus is more on understanding and making sense of underlying principles. The latter suggests students are truly interested and according to Barr (2007, p. 9):

Emirati students leave school with well-developed ‘surface’ learning abilities which enable them to memorize detail and learn by rote for an exam, [but] not all have learnt to master, or perhaps not even grasped the need for, ‘deep’ learning strategies which enable learners to put their learning to use, to criticize ideas, to solve problems, and to carry on learning. Put another way, surface learning can easily be forgotten the next day, but deep learning stays with the individual since it promotes real understanding and capacity.

The majority of students in this study would have been approximately mid-way through their education when the changeover occurred in their middle and high schools. Thus, they have experienced both the more traditional methods, and, only in the last few years, experienced the changes

in pedagogy. Although the changes were deemed ‘sweeping’, the majority had been instituted from the bottom up, meaning they started in younger years initially. Therefore, the changes for our particular population of students were relatively minimal; they remain accustomed to more traditional methods of education, which is teacher centered.

Yet another factor which deserves consideration according to DeNicola (2005) is the likelihood that the immense welfare system of this society may have produced a gap in the work-reward causation, which Hunt (2008) and Fahnestock (2008) suggest may result in little effort being made to actually learn. Hunt (2008) further suggests that their complex social history and background, as well as the fact that the pedagogy of the past has been driven by assessments themselves, may have caused little interest in learning. Hunt addresses the pedagogies the students were exposed to while in school:

The model of pedagogy used in the schools can be characterized as being generally transmission-based, with a curriculum dominated by assessment washback where much teaching and learning is aligned with and constrained by assessment practices, having the effect of narrowing teaching and learning strategies so that only such ones that are validated in assessments are considered appropriate [Hunt 2011, p. 63].

Admittedly, to alter the students approach to learning and encourage them to become autonomous learners who explore concepts on their own and focus on innovation, is the expectation of a conceptual leap of sorts from these students. However, after spending a decade working at this institution and with the help of a team of dedicated math faculty, we recognize the changes, however subtle, and believe it is possible to move forward with a program like ALEKS without compromising learning.

Within the last few years, an engineering program has been developed, where the females attend classes at the men’s campus. This was unheard of just a few years ago. As mentioned, the college is transitioning from offering mostly vocational classes to one that offers graduate programs. Further, there is currently an initiative across the colleges to transition from a laptop based teaching environment (if the students did not have a laptop with the exact specifications, they were not allowed to enroll) to one that uses only iPads (again a requirement). Change is imminent and obtaining student perspectives will provide valuable feedback regarding the process as well as advise us as educators about how to favor that process in a beneficial and minimally disruptive manner. There were approximately 270 students enrolled in the ALEKS and 189 of the students filled out the questionnaire on the portal, using their laptops.

### 3 The ALEKS Program

The math classes under study are level 2 Foundations class, where the students are enrolled in level 3 or 4 English classes. The English level of these students ranges between 3.5 and 4.5 International English Language Testing System (IELTS). It is taught four hours per week during a sixteen-week semester. The ALEKS program ([http://www.aleks.com/video/how\\_aleks\\_works](http://www.aleks.com/video/how_aleks_works)) is based on the belief that teaching math must begin by assessing what students already know and building on that knowledge. Each student is provided with an individualized curriculum by the ALEKS system that is based on his or her level of skill (Figure 1 shows a screenshot of an ALEKS lesson). Periodic formative assessments are strategically placed throughout the program, and should the student fail particular concepts they had previously passed, obvious retention did not occur, and the student must revisit those concepts. In theory, this should promote deep learning. Ausubel (1963, p. 217) suggests that an individuals' existing cognitive structure is the «principle factor influencing the learning and retention of meaningful new material». This is where learners are forced to take responsibility to actively learn material, rather than having teachers guide the process. As Harden and Crosby (2000, p. 335) suggest, the focus changes to «what students do to achieve this, rather than what the teacher does».

The program allows the teacher to track the students' progress and the amount of 'active time' working on the program as well as mastered concepts. 'Active time' refers to the time students are **actively** working and not just logged on and idle. If students master all the concepts before the end of the semester, they do not have to continue to attend class. If the students take an assessment during the semester and do not pass, the program requires them to return and review the content until mastery is achieved. Finally, the assessment process uses artificial intelligence, which

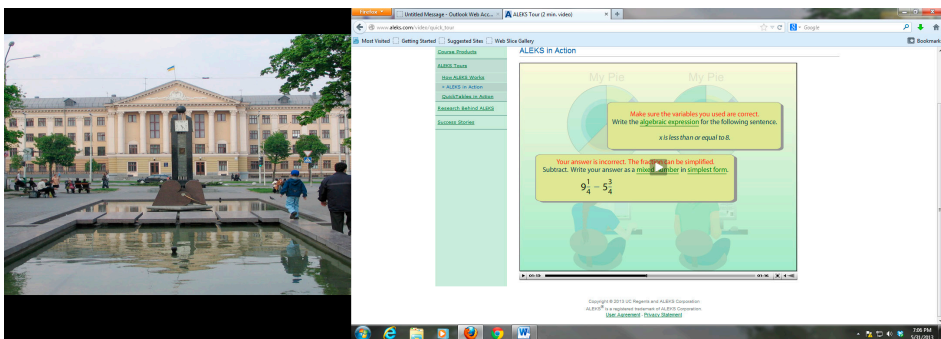


Figure 1. Screen capture 1.

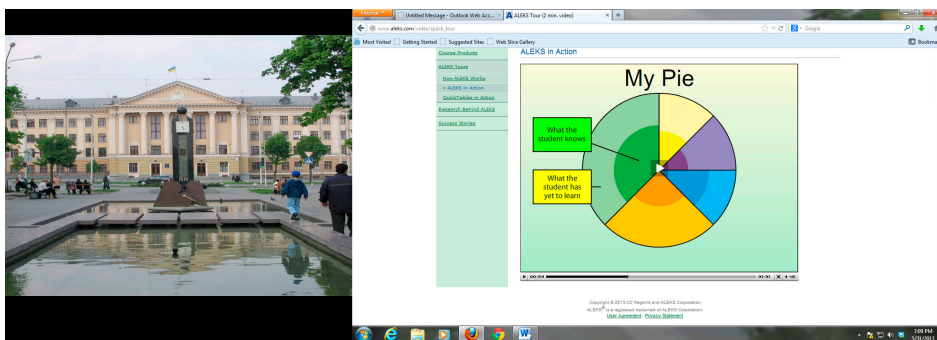


Figure 2. Screen capture 2.

allows for free response questions rather than multiple choice. This is significant because their comprehension levels are not always truly reflected in multiple-choice assessments. This allows for a better understanding of their reasoning and potential errors.

Math, like many other subjects, builds on previously learned skills. Consequently, ALEKS forces the students to build a solid foundation before allowing them to progress to more challenging concepts. In other words, the more difficult components are not made available until they have mastered the prerequisites. The pie in Figure 2 shows each individual student where they stand and what they concepts remain. As their pie fills in, shown in Figure 3, they can visually see their progress, which motivates them to complete the course sooner.

There is one other engaging component to this program and that is the Quicktables ([http://www.aleks.com/video/qt\\_quick\\_tour](http://www.aleks.com/video/qt_quick_tour)). For 15 minutes

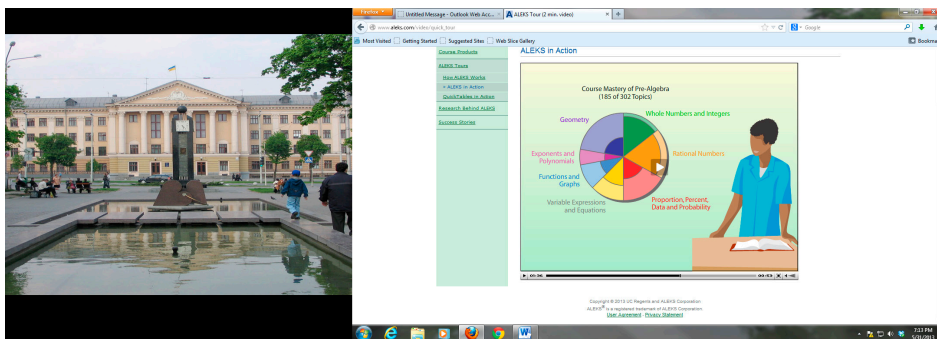


Figure 3. Screen capture 3.

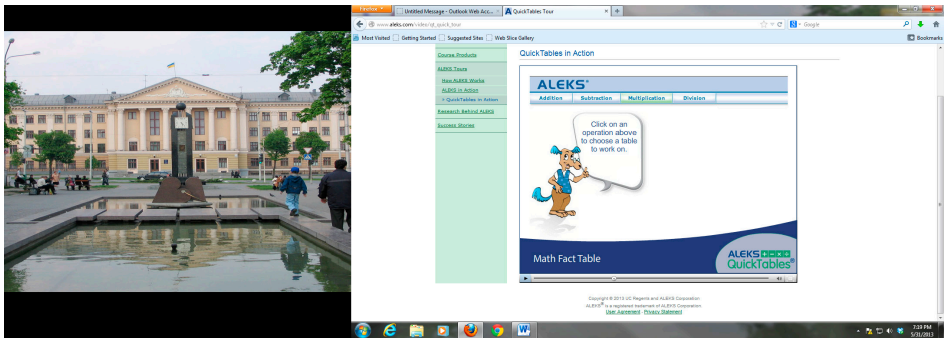


Figure 4. Screen capture 4.

every day, the students are required to work on their multiplication, division, addition and subtraction exercises without the use of a calculator. The program is timed and they must answer as quickly as possible without the aid of a calculator. Quicktables records their scores and students can watch their mental abilities become stronger throughout the semester. This is a critical tool as many students do not know their multiplication tables.

Irrefutably, the most effective way to teach a foreign language has yet to be determined, and that certainly holds true in a content class in L2. Larsen-Freeman and Long (1991, p. 3) however propose that teachers' decisions about the process of teaching should be informed by «the knowledge of the unique group of learners with whom they are working». This experimentation has demonstrated that although it is not a perfect program, ALEKS can begin to train the students to learn using a different pedagogy through the use of the formative assessments. Ultimately, our goal as teachers is to help students recognize when they have not effectively grasped a particular concept and work to resolve those inconsistencies. With the combined assistance of teachers and the ALEKS system, students are now required to review any gaps in their learning and effectively promote their own learning skills. The determining factor shall be how students perceive the experience. Despite the potential for success with this program, we are concerned because, as Cummins (1981) suggests, the academic language (i.e., technical mathematical terms) that is required in classrooms takes years to develop and needs to be specifically taught. Rote learning does not promote the use of academic language; therefore, low frequency words and concepts need to be taught in small group sessions as the students progressed because the ALEKS program was designed for the native English-speaking students. Equally, as is the case in content classes, content leads the curriculum, rather than

the necessary language skills. Further, as Dudeney and Hockly (2007) suggest, technology is not meant to replace the teacher or the blackboard or whiteboard, but rather to complement and enhance the teacher. The computer delivers lessons; however, the teacher still plays a significant role in the classroom. As noted, the students can repeat materials as much as they desire, giving them several opportunities to see the subject-specific target language. Given the vast experience the math faculty possesses with regard to the abilities of this population of students, opportunities for students can be provided to connect the subject matter with the language and use this tool in a way that promotes deeper learning rather than just surface learning.

#### **4 Methodology**

This study took place during the second semester of the academic school year 2011/2012. The semester was 16 weeks long, and the students actively worked on ALEKS for a period of 13 weeks. Prior to beginning the program, the teacher introduced some of the concepts to which they would be exposed, as well as new vocabulary. Thus, the class began with a more teacher-centered program, and then gradually transitioned to the ALEKS program. Eventually, a type of blended learning occurred, where the teacher held individual or small group lessons as required and according to the students' progress. This gradually evolved into a situation where students worked alone and at their own pace.

The overall goal was to determine their level of satisfaction regarding this pedagogical approach, with a discussion of how that compared to their impression of more traditional pedagogies of the past. An online questionnaire (see Appendix) was developed for this purpose. Approximately 70 percent of the students answered the questionnaire, although by the time it was prepared, some students had already finished the course and the end of semester was near, so classes were not consistently in session. Anonymity was ensured and students were told that their feedback would not affect their grades.

#### **5 Findings**

Understanding the concepts explained by the program was not a hindrance to learning as 34 percent of the students said they could understand the explanations and another 32 percent said they got their friends to explain it to them if they needed help and the teacher was unavailable. Another 24 percent said they had no hesitation asking their teacher for help if needed. Only 10 percent admitted to being too shy to ask for help. Despite



the program being written for native English speakers, this did not seem to be of particular concern to the majority of the students.

Most significant was that 73 percent of the students agreed they spent more time working using this method of delivery than they did in the traditional method while 70 percent admitted they learned a lot using this program. Yet, 63 percent said if they had their choice, they would prefer the teacher to teach them and not use this program at all. This echoes Hunt's (2011) findings as he suggests teachers have «underestimated the steps [she] had asked the students to take from their familiar learning practices to the unfamiliar». Using the ALEKS program is an unfamiliar practice and some anxiety or reluctance towards altering their way of learning is expected. Hunt (p. 142) continues by suggesting:

The relationship between students' habitus and field has been breached by a new discourse of learning which directly affects their existing learning practices. This opening of the possible may have shaken the cultural myth that students have constructed concerning accepted practice of [the teacher] as a teacher and their practices as learners.

Further, Williams and Burden (1997, p. 96) suggest that «ways in which individuals view the world and their perceptions of themselves within the world, particularly within a learning situation, will play a major part in their learning and construction of knowledge». Hunt (2011) affirms that the perceptions from powerful people (i.e., in this case teachers who promoted the ALEKS program) can have a profound effect on growth of personal identity, which ultimately negatively can affect the students' confidence and willingness to take risks. Not only is it a radical change for students, but they are having to work harder than previously to understand something that was once easier to simply memorize and pass. Consequently, it is only natural that a preference to return to not only the more familiar, but also the easier pedagogy, was shown.

Essentially, students are asked to craft a new type of learning identity in the classroom, and this was, not surprisingly, met with resistance. In the free response section of the questionnaire, students made comments that suggested this raised their stress levels. «Too much unnecessary pressure, we only want to finish», or «aleks brings blod blosior [blood pressure] for me [sic]» are a few examples of the comments made. Despite this unfamiliarity, the data shows that 63 percent of the students said the explanations were useful. Evidently, the students were able to cope with the reconfiguration of their roles and their former frame of reference governing traditional student-classroom behavior. Despite the negative comments, the pass rate at the end of the semester was 92 percent. Additionally, this coincides with Twigg (2004) who used a similar program for at-risk students in the United States and concluded that student learn-

ing, compared to those who remained in the traditional teacher-centered classrooms, showed statistically significant increases.

In contrast, 72 percent said they would like the teacher to teach at the beginning of each class and then let them work independently on the program. This is problematic as each student is progressing at her own pace and working on different concepts; individual or small group tutoring is preferable. Additionally, remaining in the teacher centered classroom while using ALEKS only as an extra resource and not making it a requirement was preferred by 58 percent. This suggests that their preference is either to remain in the familiar and comfortable learning environment or to simply use the program as yet another tool.

Students did not fully recognize the potential advantages to working independently or using formative assessments as an indication of how much learning took place. Just under one quarter of the students suggested that there was a benefit to having the opportunity to work at their own pace, while only 12 percent liked being able to go back over the exercises as many times as they wanted to, in order to more fully understand. Only 42 percent said they wanted to use this program for their next math course.

Assessments frustrated the students the most and it would appear that at least some of their complaints were warranted. One student commented that she had no idea what her mistakes were on her exam. Once students take an assessment, they only see their mark and are forced to return to any concepts they missed on the exam without viewing their mistakes. Admittedly, these instances should also be learning opportunities for students. More than one quarter of the students noted their frustration with assessments and this proved to be a shortcoming of the program.

Despite the high pass rate and student admissions of spending more time working on this program than previously, they failed to recognize the benefits this program offered. They still wanted the teacher to teach at the beginning of each class and denied finding benefit in the repetition of exercises. This would suggest that a transformation regarding their roles as learners did not occur in this 16-week course. It is still possible that this transformation could occur given more time spent in experiences like this and is an avenue for further study.

## 6 Conclusion

Educational reform is obviously well underway. The fact that the current younger students are learning this pedagogical approach from the start of their education is beneficial as the students in this study have reflected what an abstract concept this change in roles is for them and how it adds negatively to their stress levels, despite their successful marks. Fostering

personal and independent growth was a goal in this study; yet, after this experience, only 7 percent of my students preferred to use ALEKS on their own without the teacher.

There is no denying that technology has advantages in the classroom, however this study shows the need to be cautious as educators select the specific populations who stand to gain from this type of reform. A recommendation includes allowing students to choose their subject matter, but given that math is a core requirement, choice is not possible. As Harlen (2006) suggests, educators must convince students to focus on learning tasks they may not find interesting. It would have been beneficial to include more authentic activities with the use of video, yet the program only contained reading materials with little or no practical applications. All the concepts are thoroughly explained and many examples are provided, but real world applications that would have interested students are absent. This remains another avenue for further research and one which should involve a consideration for culture as well.

Given the findings from the questionnaire, this particular student population would benefit from using this type of program as an addition but not a replacement for learning as their preference was clearly to be teacher led. Howard (2008, p. 4) suggests that the students' «experiences, attitudes, and learning strategies must be different than before; otherwise they will likely obtain the same results». It was indeed a different experience for students. Even though a foreign practice for students that created unnecessary stress, it still inadvertently resulted in a high success rate, a success in itself.

A final recommendation is to use a more graduated approach where the teacher acts in a more traditional role until students have had more opportunities to explore learning on their own, rather than being thrust into it. This would build more confidence and allow them to become more comfortable with their seemingly awkward success. The findings also suggest that students be given this alternative if they so desire, with the caveat that they can finish early should they complete all the work. However, educational institutions should also make available the traditional pedagogy as well. The findings further suggest that overlooking students' valuable feedback would be a big mistake. This is echoed by Foucault, in Oksala (2007, p. 99) who suggests that if we change our behaviors by relying on the power we possess as instructors, we then ignore «the proliferation of diversity and uniqueness» of our students.

## Appendix: Math Questionnaire ALEKS

|  |  |            |                 |
|--|--|------------|-----------------|
| 1) I enjoyed using my laptop to learn math   | 1) استمتعت باستخدام الكمبيوتر النقال لأتعلم الرياضيات  |            |                 |
| لا أوافق أبدا<br>SDA   | لا أوافق<br>DA   | أوافق<br>A | أوافق جدا<br>SA |
| 2) It was hard to learn math using the computer  | 2) وجدت صعوبة في تعلم الرياضيات باستخدام الكمبيوتر   |            |                 |
| لا أوافق أبدا<br>SDA   | لا أوافق<br>DA   | أوافق<br>A | أوافق جدا<br>SA |
| 3) The language used in the software package for explanations was difficult  | 3) اللغة المستخدمة لشرح المفاهيم في هذا البرنامج صعبة  |            |                 |
| لا أوافق أبدا<br>SDA   | لا أوافق<br>DA   | أوافق<br>A | أوافق جدا<br>SA |
| 4) The explanations used in the software package were useful   | 4) الشرح المستخدم في هذا البرنامج مفيد   |            |                 |
| لا أوافق أبدا<br>SDA   | لا أوافق<br>DA   | أوافق<br>A | أوافق جدا<br>SA |
| 5) I don't ask the teacher questions during class time, because (tick any that apply and you may tick more than one):<br>a. I am too shy<br>b. It is easy to understand the explanations in the software<br>c. My friends explain it to me<br>d. I don't have a problem asking my teacher a question during class time | 5) لا أسأل المدرس أسئلة في الصف وذلك للأسباب التالية (ضعي إشارة صح عند الإجابة التي تختارينها وبإمكانك اختيار أكثر من إجابة):<br>1) أنا خجولة جدا<br>2) من السهل علي فهم الشرح الموجود في هذا البرنامج<br>3) تقوم صديقاتي بشرح المفاهيم الصعبة<br>4) اذا وجدت صعوبة في حل المسائل ليس لدي أي مشكلة في سؤال المدرس عنها في الصف |            |                 |
| 6) I would like to learn other subjects using this type of software  | 6) أود أن أتعلم مواد أخرى باستخدام هذا النوع من برامج الكمبيوتر  |            |                 |
| لا أوافق أبدا<br>SDA   | لا أوافق<br>DA   | أوافق<br>A | أوافق جدا<br>SA |
| 7) I spent more time studying math using this software than I usually do the traditional way   | 7) باستخدام برنامج الكمبيوتر هذا أمضيت وقتا أطول في دراسة الرياضيات عما قد أمضيه في الدراسة باستخدام الطريقة التقليدية (الكتاب والمدرس)  |            |                 |

| لا أوافق أبدا<br>SDA  | لا أوافق<br>DA | أوافق<br>A  | أوافق جدا<br>SA |
|---|----------------|---|-----------------|
| 8) I prefer the teacher to teach me this math course and not to use ALEKS at all  |                | 8) أفضل أن يقوم المدرس بشرح هذا المساق من الرياضيات وأن لا أستعمل أليكس أبدا  |                 |
| لا أوافق أبدا<br>SDA  | لا أوافق<br>DA | أوافق<br>A  | أوافق جدا<br>SA |
| 9) I had more fun learning math this way than having my teacher teach   |                | 9) استمتعت أكثر في دراسة الرياضيات بواسطة برنامج الكمبيوتر أكثر من استمتاعي بالدراسة مع المدرس  |                 |
| لا أوافق أبدا<br>SDA  | لا أوافق<br>DA | أوافق<br>A  | أوافق جدا<br>SA |
| 10) What aspects of using this software did you enjoy? Tick any that apply (you may tick more than one)<br>a. I could work at my own pace<br>b. I liked working with my laptop<br>c. It was easy to use<br>d. I preferred this rather than listening to my teacher talk<br>e. I liked the examples<br>f. I liked being able to go back as many times as I needed to get help with something I didn't understand<br>g. I liked the idea of being able to use this from home if I want to |                | 10) عند استخدامك برنامج الكمبيوتر هذا، ما هي الأشياء التي استمتعت بها؟ ضعي إشارة صح عند الاجابة التي تختارينها (بامكانك اختيار أكثر من اجابة)<br>أ) استطعت أن أعمل بمفردتي<br>ب) أحببت العمل على الكمبيوتر النقال<br>ت) كان برنامج الكمبيوتر سهل الاستخدام<br>ث) فضلت العمل على الكمبيوتر أكثر من الاصفاء لشرح المدرس<br>ج) أحببت الأمثلة<br>ح) أحببت فكرة امكانية الرجوع عند الحاجة الى الصفحات السابقة عدة مرات للحصول على المساعدة في فهم أي شي لم أفهمه في المرة الأولى<br>خ) أحببت فكرة امكانية استخدام هذا البرنامج من المنزل اذا أرت ذلك |                 |
| 11) I would like to use this type of learning for my next math course   |                | 11) أحب استخدام نفس أسلوب التعلم في المساق التالي من مادة الرياضيات   |                 |
| لا أوافق أبدا<br>SDA  | لا أوافق<br>DA | أوافق<br>A  | أوافق جدا<br>SA |
| 12) I would like my teacher to teach at the beginning of the class and then let me work on my own using ALEKS   |                | 12) أفضل أن يقوم المدرس بالشرح في بداية الدرس ومن ثم أقوم بالعمل لوحدي على أليكس  |                 |
| لا أوافق أبدا<br>SDA  | لا أوافق<br>DA | أوافق<br>A  | أوافق جدا<br>SA |

|   |  |            |                 |
|---|--|------------|-----------------|
| 13) I liked the idea of being able to work ahead and finish early and this motivated me to want to work harder  | 13) أعجبتني فكرة امكانية العمل بجد للانتهاء من المساق باكرا (قبل انتهاء الفصل الدراسي) اذ حفزتني على العمل باجتهد  |            |                 |
| لا أوافق أبدا<br>SDA  | لا أوافق<br>DA   | أوافق<br>A | أوافق جدا<br>SA |
| 14) Pick any that apply (you may tick only one):<br>a. I would prefer to study this math course totally on my own using ALEKS<br>b. I would like to study this math course on my own using ALEKS but have my teacher available if I have to ask questions<br>c. I would like my teacher to teach at the beginning of the class and then let me work on my own using ALEKS<br>d. I prefer the teacher to teach me this math course and not to use ALEKS at all | 14) اختاري ما ينطبق عليك مما يلي (بامكانك اختيار اجابة واحدة فقط)<br>1) أفضل أن أدرس مساق الرياضيات هذا بالاعتماد كليا على نفسي باستخدام أليكس<br>2) أفضل أن أدرس مساق الرياضيات هذا بالاعتماد كليا على نفسي باستخدام أليكس ولكن بوجود المدرس في حال احتجت لسؤاله<br>3) أفضل أن يقوم المدرس بالشرح في بداية الدرس ومن ثم أقوم بالعمل لوحدي على أليكس<br>4) أفضل أن يقوم المدرس بشرح هذا المساق من الرياضيات وأن لا أستعمل أليكس أبدا |            |                 |
| 15) I would prefer to study this course from a book and use this software as an extra resource  | 17) أفضل أن أدرس مساق الرياضيات هذا بالاعتماد كليا على نفسي باستخدام أليكس   |            |                 |
| لا أوافق أبدا<br>SDA  | لا أوافق<br>DA   | أوافق<br>A | أوافق جدا<br>SA |
| 18) Tick any that apply (you may tick more than one):<br>a. The language used in ALEKS is easy<br>b. The explanations used in ALEKS are helpful<br>c. I like the way ALEKS keeps track of my progress<br>d. I like the assessment style of ALEKS<br>e. I was frustrated with the assessment style in ALEKS  | 18) ضعي اشارة صح عند الاجابة التي تختارينها (بامكانك اختيار أكثر من اجابة)<br>1) اللغة المستخدمة في أليكس سهلة<br>2) الشرح الموجود في أليكس مفيد<br>3) أعجبتني طريقة أليكس في تتبع ما أحرزه من تقدم في مادة الرياضيات<br>4) أعجبتني أسلوب الامتحانات في أليكس<br>5) كنت محبطة من أسلوب الامتحانات في أليكس   |            |                 |
| 19) I would like to study this math course on my own using ALEKS but have my teacher available if I have to ask questions   | 19) أفضل أن أدرس مساق الرياضيات هذا بالاعتماد كليا على نفسي باستخدام أليكس ولكن بوجود المدرس في حال احتجت لسؤاله   |            |                 |
| لا أوافق أبدا<br>SDA  | لا أوافق<br>DA   | أوافق<br>A | أوافق جدا<br>SA |
| 20) Do you have any other comments/suggestions?   | 20) هل لديك أي تعليقات أو اقتراحات أخرى؟   |            |                 |

---

**References**

- Ausubel, D.P. (1963). «Cognitive Structure and the Facilitation of Meaningful Verbal Learning». *Journal of Teacher Education*, 14, pp. 217-221.
- Barr, P. (2007). «Working Towards Graduate Outcomes». In: Barr, P. (ed.), *Foundations for the Future: Working Towards Graduate Outcomes*. Abu Dhabi: HCT Press, pp. 7-13.
- Beilock, S.L. (2010). *Choke: What the Secrets of the Brain Reveal About Getting It Right When You Have to*. Free Press: New York.
- Briggs, C.L.; Keyek-Franssen, D. (2010). «‘Clickers and CATs’: Using Learning Response Systems for Formative Assessments in the Classroom» [online]. *Educause Quarterly*, 33 (4). <http://www.educause.edu/ero/article/clickers-and-cats-using-learner-response-systems-formativeassessments-classroom> (2013-08-12).
- Cummins, J. (1981). «The Role of Primary Language Development in Promoting Educational Success for Language Minority Students». In: *Schooling and Language Minority Students: A Theoretical Framework*. Los Angeles, CA: Evaluation, Dissemination and Assessment Center, California State University, pp. 3-49.
- DeNicola, C. (2005). *Dubai’s Political and Economic Development: An Oasis in the Desert?* [doctoral thesis; online]. Williamstown, MA: Williams College. <http://library.williams.edu/theses/pdf.php?id=48> (2013-08-12).
- Dudeney, G.; Hockly, N. (2007). *How to Teach English with Technology*. London: Longman.
- Entwistle, W.; Ramsden, P.J. (1983). *Understanding Student Learning*. Kent: Croom Helm.
- Fahnestock, N. (2008). *Data Analysis and Presentation* [unpublished manuscript]. Exeter, UK: University of Exeter School of Education.
- Harden, R.M.; Crosby, J. (2000). «AMEE Guide, No 20: The Good Teacher is More than a Lecturer: The Twelve Roles of the Teacher». *Medical Teacher*, 22 (4), pp. 334-347.
- Harlen, W. (2006). «The Role of Assessment in Developing Motivation for Learning». In: Gardner, J. (ed.), *Assessment and Learning*. London: Sage, pp. 81-80.
- Al Nahyan, H.E. Sheikh Nahyan Mubarak (2011). *Official address 24th HCT Annual Conference*. Higher Colleges of Technology, September 10, 2011.
- Howard, L. (2008). *Developmental Students’ Perceptions of Unsuccessful and Successful Mathematics Learning* [doctoral dissertation]. Logan, UT: Utah State University.
- Hunt, N. (2011). *The Development of Student Teacher Identities through Undergraduate Action Research Projects: An Emirati Case Study* [Doctoral thesis]. Exeter, UK: University of Exeter School of Education.
- Larsen-Freeman, D.; Long, M.H. (1991). *An Introduction to Second Language Acquisition Research*. New York: Longman.

- Macpherson, R.; Kachelhoffer, P.; El Nemr, M. (2007). «The Radical Modernization of School and Education System Leadership in the United Arab Emirates: Towards Indigenized and Educative Leadership». *International Studies in Educational Administration*, 35 (1), pp. 60-77.
- Marton, F. (1975). «What Does It Take to Learn?». In: Entwistle, N.J.; Housell, D. (eds.), *How Students Learn*. Lancaster: Institute for Post-Compulsory Education.
- Oksala, J. (2007). *How to Read Foucault*. New York: W.W. Norton.
- Twigg, C.A. (2004). «Using Asynchronous Learning in Redesign: Reaching and Retaining the At-Risk Student». *Journal of Asynchronous Learning Networks*, 8 (1), pp. 2-12.
- Williams, M.; Burden, R. (1997). *Psychology for Language Teachers: A Social Constructivist Approach*. Cambridge: Cambridge University Press.