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Saudi Students' Flying the Nest of "Knowledge": Reality and Prospects

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Abstract: The paper investigates Saudi university students' traditional and predominant learning strategies of "remembering" and the prospects of persuading them to adopt higher learning strategies like "understand", "apply", "analyse", "evaluate", and "create". The study was conducted with 33 fourth year students of the Department of English of King Khalid University, Saudi Arabia, who were never formally trained for critical thinking. The researcher tried to instil critical thinking skills in one of their courses for one semester (42 contact hours) by adopting heuristic teaching method and challenging students' cognitive skills in the tests. Statistical data analysis of their final examination scores confirms the widely acknowledged view that they are very good in memorization. However, after completing the course, they were found to be able to reduce their dependence on "remembering" as they had developed their learning domains of "understand", "apply" and "analyse" if not those of "evaluate" and "create". The paper concludes that if the students' critical thinking skills can be developed to this extent in a stand-alone course in such a short time, a combined and synchronized effort of all the course teachers throughout the students' academic career would be able to develop all higher order cognitive skills, including "evaluate" and "create", in a much better way.

Keywords: Saudi Arabia, knowledge, cognitive skills, revised Bloom's Taxonomy.

1. Introduction

In the golden age of its economic prosperity, when Saudi Arabia is trying to lift its dependence on oil and reform its education system to develop a knowledge-based economy (The Ministry of Planning and National Economy 2006)—an essential precondition to move towards the centre of Wallerstein's capitalist *modern world system* (Wallerstein 2006)—Saudi universities are instructed to incorporate critical thinking skills in their education programs (National Qualifications 2009: 4-5). To this end, "National Qualifications Framework for Higher Education in the Kingdom of Saudi Arabia" (NQF) (National Qualifications 2009) has been designed to produce the

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graduates of high international standard who among many other things should have a wide range of thinking and problem solving skills (Ennis 1989, 1990, 1993, 1997; Siegel 1988; McPeck 1990; Paul 1992; 1995; 2008; Facione, Facione, & Giancarlo 1992; Swartz & Parks 1994; Halpern 1998; Fisher 2001; Elder 2002; 2005). However, apparently, NQF's expectation of developing the students' "ability and commitment to engage in lifelong learning, capacity for effective communication…, and the ability to take initiative in individual and group activities" (National Qualifications 2009: 3) is improbable, if not impossible, to realize in the shadow of current and past Saudi educational practices where critical thinking skills are discouraged (Elyas 2008; Al-Essa 2009; Al-Miziny 2010; Al Ghamdi, Amani, & Philline 2013).

Saudi education has two lineages—traditional and formal. The curriculum of traditional Qur'anic school was meant to develop "remember" and "understand" (terms are explained in Table 1). In this type of school, the key method of learning was memorization for two reasons: firstly, memorization of the Holy Book is glorified in Hadith (Al Bukhari n.d.: 93: 489), and secondly, the transmission of the Qur'an from one generation to another could be achieved only orally in the past. On the other hand, formal education has been organized into two types of schooling—the *kuttab* and *madrassa* (Tibi 1998). For many years *kuttab* was the only type of formal education in Saudi Arabia and its curriculum was centred around religion, the Arabic language and basic arithmetic. In the twentieth century, although the modern elementary school (*madrassa*) replaced *kuttab* but it still continued the legacy of the old syllabus and method of instruction (where the teacher acted like a preacher). In the 1970s, Szyliowicz (1973) observed that Saudi public schools and universities followed the same instruction methods:

> The following method of instruction prevailed in medieval Islam through [sic] adaptations were [sic] made to meet the needs of different levels of instruction. Formal delivery of lecture with the lecturer squatting on a platform against a pillar and one or two circles of students seated before him was the prevailing method in higher levels of instruction. The teacher read from a prepared manuscript or from a text, explaining the material, and allowed questions and discussion to follow the lecture.

Baker (1997: 246) observed the same instruction method in Saudi Arabia where the students were the poor third component in classroom after teacher and textbooks and so did John Goodlad (1984) in an extensive research in secondary schools. Goodlad found that Saudi textbooks were often a substitute for pedagogy and that teaching methods tended to be mechanistic and engaging, and that memorization and rote learning were favoured consistently over critical thinking and creativity.

In a similar vein, in the twenty first century, Elyas and Picard (2010: 138) observe that the preacher-like teacher-centred Saudi classroom resembles *Halgah*—a religious gathering at a mosque where the imam preaches and the passive audience listens attentively and exclusively to him. However, sometimes, the preacher-like powerful teachers provide some latitude for interactions to the students with some strict parameters—the students are not free to ask questions on all the topics and assumptions

(Jamjoon 2009: 7-8). Over and above, many other scholars (Elyas 2008; Al-Essa 2009; Al-Souk 2009; Al-Miziny 2010; Al Ghamdi, Amani, & Philline 2013) agree that present Saudi education still revolves around teacher and textbook centeredness where the students are not encouraged to participate in classroom activities, ask questions, and think critically and creatively. Allamnakhrah (2013) argues that four factors are responsible for this seemingly unchangeable teaching/learning methods: a) teachers, b) society, c) students, and d) education system. Among these factors, the researcher observes that although the teachers are supposed to take initiative and influence the other factors in order to change the traditional teaching/learning methods, they cannot or do not do these because most of them:

1. do not have clear idea about what critical thinking is.
2. are not trained to teach critical thinking skills.
3. were never taught critical thinking skills.
4. think that teaching critical thinking skills is difficult.
5. cannot withstand the students' resistance.
6. apprehend students' mass-failing in the exams.
7. are afraid of job termination (particularly the expatriate teachers) for students' failure.

It is to be noted here that 14,915 (Mohammed 2014) out of 41,927 university teachers (Ministry of Education 2013) are expatriates. However, any teacher teaching cognitive skills might feel like swimming against the stream in Saudi Arabia where the culture is predominantly one of uncritical submission to authority (Al-Essa 2009; Al-Miziny 2010; Allamnakhrah 2013: 8).

Thus, Saudi tertiary education lacks a focus on critical thinking and problem solving activities—memorization is given more importance than inquiry based learning. (Al Ghamdi, Amani, & Philline 2013) and this instrumentalized pedagogy indoctrinates the students to become superficial learners and nothing more, always caring more about the grade than about real, authentic learning.

In this context, the paper investigates whether it is possible to develop the students' higher domains of learning with two research questions:

1. Is it possible to motivate the students to come out of the secured domain of learning—"knowledge"?
2. Is it possible to develop the students' capability of critical thinking?

2. NQF's Learning Outcomes and Bloom's Taxonomy

In NQF (*National Qualifications Framework* 2009), there are five domains of learning outcomes—knowledge, cognitive skills, interpersonal skills and responsibility, communication, information technology and numerical skills, and psychomotor skills. As it is discussed above, the students are not even ready to develop their cognitive skills let alone the higher domains like "interpersonal skills and responsibility" or "communication". Hence this study is concerned with an attempt to raise students' learning domain from "knowledge" to "cognitive skills" (see Table 1)

which correspond to Revised Bloom's Taxonomy (Anderson *et. al.* 2001) (see Table 2).

NQF Domains	Learning Outcomes
Knowledge	Ability to recall, understand, and present information, including: knowledge of specific facts, knowledge of concepts, principles and theories, and knowledge of procedures.
Cognitive skills	Ability to apply conceptual understanding of concepts, principles, theories Ability to apply procedures involved in critical thinking and creative problem solving, both when asked to do so, and when faced with unanticipated new situations Ability to investigate issues and problems in a field of study using a range of sources and draw valid conclusions.

Table 1. NQF domains and learning outcomes

In order to understand NQF's first two learning domains—knowledge and cognitive skills—it is better to see them from RBT point of view because these domains are in fact nothing but the rephrasing of Revised Bloom's Taxonomy (RBT). NQF's "knowledge" includes "remember" and "understand" of RBT which were named as "knowledge" and "comprehension" in original Bloom's Taxonomy (BT) (Bloom *et al*., 1956). The second domain in NQF's hierarchy is "Cognitive skills" which corresponds to "apply", "analyse", "evaluate", and "create" of RBT termed as "application", "analysis", "synthesis" and "evaluation" in BT.

NQF domains	RBT categories	RBT subcategories
Knowledge	Remember—Retrieving relevant knowledge from long-term memory.	Recognizing, Recalling
	Understand—Determining the meaning of instructional messages, including oral, written, and graphic communication.	Interpreting, Exemplifying, Classifying, Summarizing, Inferring, Comparing, Explaining
Cognitive skills	Apply—Carrying out or using a procedure in a given situation.	Executing, Implementing
	Analyse—Breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose.	Differentiating, Organizing, Attributing
	Evaluate—Making judgments based on criteria and standards.	Checking, Critiquing
	Create—Putting elements together to form a novel, coherent whole or make an original product.	Generating, Planning, Producing

Table 2. NQF and RBT

The cognitive skills as described above in Tables 1 and 2 are not innate and cannot be acquired independently by the students (Lundquist 1999; Rippen, *et. al.* 2002; Landsman & Gorski 2007), and as the teachers are not dealing with them in

classrooms (mentioned above), it can be inferred that Saudi students are not aware of critical thinking, which Scriven & Paul (2007) describe as a systematic and procedural approach to the process of thinking.

3. Method

The study was conducted in English department in King Khalid University, Saudi Arabia. As the researcher has been teaching in the department for the last seven years, he is well aware of the students' learning strategies, the method of instruction by which they were taught in their schools and university, and about the types of question, they usually answer in quizzes, assignments, and examinations.

Participants

Thirty three fourth year students of English department of King Khalid University, Saudi Arabia participated in the study. The graduating students were selected as the sample of the study because they were supposed to have the required linguistic competence to express their critical thinking on the one hand, and, on the other, their performance may be considered to be one of the major indicators which shows whether critical thinking skills is practiced in the lower levels or not. The young adults (aged 20–23) were studying a course named "Applied Linguistics 1" in the first semester of the academic year 2014-2015. The course was based on the basic introductory concepts of Applied Linguistics.

Material

The students studied a textbook covering the topics like definition and areas of Applied Linguistics, major theoretical approaches, non-linguistic factors which affect language learning, and learning strategies.

Procedure

As students are motivated to perform well on examinations, and as the exam questions can strongly influence their study strategies (Entwistle & Entwistle, 1992; Gardiner 1994; Scouller 1998), at the beginning of the course, the researcher told them that the final exam would challenge their "knowledge" as well as "cognitive skills". Accordingly, the researcher focused on the domains of "knowledge" and "cognitive skills" while teaching the students (for 42 contact hours) and giving them tests (first and second mid-terms for 40 marks) and 13 assignments (10 marks) for three months and 15 days (September 2014—mid-December 2014). As it was not possible and necessary to deal with "remember" in a 45 minutes classroom, the researcher focused only on one category of the domain of "knowledge" —"understand"— and three categories of the domain of "cognitive skills"—"apply", "analyse", and "evaluate". As mentioned above, 42 hours were allocated for the course and out of these hours the researcher tried to give 10 hours for each category. Out of 10 hours, two hours (20% of the allocated time for each category) were spent for lecturing and eight hours (80% of the allocated time) were spent for classroom activities. The instructional design was based on the following principles:

1. Classrooms were student-centred.

2. Students were taught “how to think” rather than “what to think”.
3. Conceptualization was given more importance than facts.
4. Students’ silence was tolerated for processing and formulating their response as human beings need at least eight to 12 seconds for preparing their answers in critical thinking situations (Schafersman 1991).
5. After each test, questions were reviewed and the correct answers were explained by modelling the critical thinking process.

Test

At the end of the course, the researcher framed 15 short questions in order to test the students’ “knowledge” and “cognitive skills”—three questions for each of the five categories of RBT: “remember”, “understand”, “apply”, “analyse”, and “evaluate” (see Table 3) which correspond to NQF’s first two domains—“knowledge” (remember and understand) and “cognitive skills” (apply, analyse, and evaluate). The highest category of both RBT and NQF’s “cognitive skills”—“create” was not included here for the lack of adequate time. However, each question was for two marks and so the whole test was for 30 marks.

NQF domains	RBT categories	Subcategories	Questions
Knowledge	Remember	Recalling	What is Error Analysis? What is Contrastive Analysis? Define Applied Linguistics.
	Understand	Explaining	Why are learners’ errors important? Why should a teacher lower his students’ anxiety? How does “age” affect language learning?
Cognitive skills	Apply	Executing/ Implementing	How should you collect your students’ errors for Error Analysis? How did you develop your English—by “learning” or by “acquisition”? Justify your answer. What kind of motivation, according to you, do most of the Saudi English language learners have? Why?
	Analyse	Differentiating	Describe the similarities and differences between Contrastive Analysis and Error Analysis. How is Applied Linguistics different from Linguistics?
		Attributing	Which language learning strategies do you like to use while learning English? Why do you prefer those particular strategies?
	Evaluate	Critiquing	Do you believe that language learning is nothing but habit formation? Justify your answer. Critique Error Analysis. “An extrovert learner is better than an introvert learner in speaking”. Do you agree or disagree with this statement? Give reasons in support of your answer.

Table 3. Questions in terms of NQF domains and RBT categories

In order to test the students' "knowledge" and all the skills of all the learning domains except "create", the researcher found it useful to take one particular topic like "Error Analysis" and developed a series of increasingly challenging questions for the five hierarchical levels. It is to be noted here that the answers to the "cognitive skills" questions were not previously provided through classroom instruction because if the students got the answers before and memorized them, the high order cognitive skills questions would only require recall (Allen & Tanner 2002).

Data Analysis

Marking the papers. Two independent raters marked the students' answers for assessing their "knowledge" and "cognitive skills" ignoring the grammatical mistakes. The raters assessed the answers to the cognitive skills questions on the following basis:

1) Clarity and accuracy of thinking.
2) Depth and breadth of thinking.
3) The number of alternatives considered.
4) Do the students know why they think the way they do?

Interrater reliability for marking the papers. The marks given to the students' answers by two independent raters were analysed through the Pearson Correlation Coefficient Test. The correlation coefficient (r) between the two sets of marks was .78, $p < .01$, which was considered to be consistent enough to proceed with further statistical analysis.

Statistical analysis. The participants' scores were analysed by using paired sample t test and post-hoc LSD (least significant difference). Cohen's d was also used to calculate the effect size.

4. Results and Discussion

The results are illustrated in Tables 4 and 5. As can be seen, differences exist between students' scores for different questions, but the mean differences are not always significant. The students' scores are less in "cognitive skills" questions than in "knowledge" questions. In a similar vein, the students did better in lower category "cognitive skill" questions than higher category "cognitive skill" questions.

NQF Domains	RBT categories	N	Mean	SD
Knowledge	Remember	99	1.369	.758
	Understand	99	1.354	.753
	Total	198	1.361	.754
Cognitive skills	Apply	99	1.101	.799
	Analyse	99	1.091	.784
	Evaluate	99	.955	.773
	Total	297	1.049	.785

Table 4. Mean scores for different category questions

Conditions	Mean Difference	*p*	*t*	*df*	Cohen's *d*	Effect size
Remember vs. Understand	.015	.862	.173	98	.013	.006
Knowledge (remember+understand) vs. Apply	.268	.0016**	3.24	98	.335	.165
Knowledge vs. Analyse	.278	.0010**	3.40	98	.352	.173
Knowledge vs. Evaluate	.414	.0001**	4.51	98	.772	.360
Knowledge vs. Cognitive skills	.265	.0001**	4.389	197	.624	.297

*$p < .05$. **$p < .01$.

Table 5. Comparison of the mean scores of categories and domains

As can be seen in Table 5, the difference between the scores of "evaluate" (*M*=.95) and "knowledge" (*M*=1.36) has considerable effect size (*d*=.77) and so has the mean difference between the two domains (*d*=.62)—"knowledge" (*M*=1.36) and "cognitive skills" (*M*=1.04). In other cases, the mean differences are small and statistically insignificant. The smallest mean difference is in between the two categories of "knowledge" domain—"remember" (*M*=1.36) and "understand" (*M*=1.35) with insignificant effect size (*d*= .01). Therefore, the domain of "knowledge" as a whole is compared with the components of the domain of "cognitive skills" separately.

Discussion

The present study aimed to investigate whether Saudi university students' domains of "knowledge" and "cognitive skills" can be developed in line with NQF's guidelines a part of which (domains of knowledge and cognitive skills) is designed on the basis of the RBT. The small mean difference between the scores for the two categories of the domain of knowledge—"remember" and "understand" suggest that if they are taught properly, the students will be able to understand what they memorize. The high mean scores of "remember" and "understand" also prove the widely acknowledged view that Saudi students' most common strategy of learning is memorization.

However, the statistics illustrate that the students can also do good in the first two categories of the domain of "cognitive skills"—"apply" and "analyse"—if they are focused in classroom/quizzes/assignments/tests. The students' scores in these categories are as good as those in the categories of the domain of "knowledge"—"remember" and "understand". In contrast, the mean scores of the third category of the domain of "cognitive skills" is much lower than that of the domain of "knowledge" which indicates that it is not easy to develop the students' capability to "evaluate" by a single teacher in a single course. Therefore, though the highest category of "cognitive skills" is not included in the study, it can be inferred that it needs the concerted and simultaneous effort of all the teachers to develop the students' capability to "evaluate" and "create".

With regard to the first research question—"Is it possible to motivate the students to come out of the secured domain of learning—'knowledge'"? —the results

confirmed that though the students resist at the beginning, it is possible to motivate most of the students to develop their domain of "cognitive skills". The answer to the first research question is in fact the partial answer to the second research question—"Is it possible to develop the students' capability of critical thinking?". Statistical analysis of their scores shows that at least the two lowest categories of "cognitive skills" can be developed in a stand-alone course. Therefore, if a synchronized and concerted effort by all the teachers of a department is aimed at embedding and integrating critical thinking throughout the students' academic career, they would score much better results in all the categories of "cognitive skills".

5. Conclusion and Implications

Two conclusions, with some caveats described below, can be drawn from this study. Firstly, if the teachers persuade and train the students to fly their nests of "knowledge", in order to "undertake investigations, comprehend and evaluate new information, concepts and evidence from a range of sources, and apply conclusions to a wide range of issues and problems with limited guidance" (National Qualifications, 2009: 19), the students would realize their own "innate" potential and be encouraged to ascend the higher categories of "cognitive skills". Secondly, in order to ensure the students' *instrumental motivation*—he has to make it very clear at the outset of a course that without developing their cognitive skills they would not be able to pass the exam.

This study is not without limitations. Firstly, this study was conducted in a very short period of time—three months and 15 days to be exact, and hence the highest category of the domain of "cognitive skills"—"create"—could not be included. Secondly, the number of participants could not be increased while controlling the "teacher" variable and so the sample was small. A larger sample could tolerate individual variations better in statistical analysis. Lastly, for the lack of qualitative data regarding students' attitudes and experience, their opinions and beliefs remained unexplored.

Despite these limitations, the results of this study have important pedagogical implications. Given the fact that the students did considerably good in at least two lowest categories of the domain of "cognitive skills" in a matter of three and a half months, the teachers can tap into the students' latent capability of achieving all the cognitive skills suggested by NQF and unlock them without fearing students' failing and their own job termination.

In short, it is true that Saudi students are still heavily dependent on memorization and they are unwilling to fly the nest of "knowledge" in order to soar towards the higher level cognitive skills. However, it is not difficult to change their mindset which seems to be fixed and unchangeable, if the higher domains of learning can be integrated or embedded throughout the undergraduate students' academic career, not just in one, stand-alone course.

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