



**Original Research Article**

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**Development of study guide and student's perception about it as an essential tool in learning Biochemistry at RAK Medical & Health Sciences University, Ras Al Khaimah.**

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**Abstract**

**Objectives:** To explore the perception of the student's about study guide. To share the experience of developing study guide for the students of biochemistry course at RAK Medical and Health Sciences University (RAKMHSU).

**Methods:** This cross-sectional study was carried out at RAK College of Medical Sciences (RAKCOMS), Biochemistry department and comprised of 1<sup>st</sup> year medical students. Students enrolled were 98 and represented as final study sample. A 10 items of questionnaire was administered to know the perception of students about study guide. Data was analyzed using descriptive analysis on SPSS 16. Analysis of variance was used for looking at differences in perceptions of the two groups of students, One sample Kolmogorov-Simonov test was applied on significant differences ( $p < 0.05$ ). **Results:** There were 60 (61%) females and 38 (39%) males. More than (90%,  $p < 0.001$ ) of students completely agreed with the use and importance of the study guide in learning biochemistry.

**Conclusion:** The perception about the importance of study guide was well appreciated by students. Their content will be reviewed and modified based on the results of this study.

**Keywords:** Study guides, Perception, Learning outcomes, Medical-students.

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**Introduction**

Undergraduate medical education in the 21st century is faced with many challenges. One of them is designing effective course syllabi. Teaching is when done well is the most delightful and exciting of all human activities. (1)

Alignment of learning outcomes, teaching methodology and assessment helps to make their overall learning experience more transparent and meaningful for the students. (2)

Learning to think about the process of syllabus construction is more important than striving for a definitive final product. (3)

Study Guide is an important feature of this process and evolved to become a valuable supplement to the tutor's contribution and a day-to-day aid in student learning. (4)

A study guide is an aid, in a printed or electronic format, designed to assist the students with their learning. It indicates what should be learned, how it can be learned and how students can recognize if they have learned it. A study guide can be linked to a tutor sitting on the students shoulder an available 24 hours a day to advise the student what he/she should be doing at any stage in his/her study. It allows the teacher to exercise his/her responsibilities while at the same time helping the student to manage his/her own learning. (5)

Study guide has three roles in facilitation of the learning: (A) Assisting in the management of student learning; (B) Providing a focus for student activities related to the learning; (C) Providing the information on the subject or topic of study. (5)

A well-written guide is a management tool that encourages both the teacher and the student to assume responsibility for the learning. (5)

Previous studies have claimed that effective study guide should be designed 'to help the students as a good tutor might if they were present whilst a student studies.(6)

It stated that "a study guide should include far more than merely a list of detailed curriculum objectives and a copy of the course timetable, for how else will teachers know what to teach, students know what to learn and examiners know what to examine." Others have stated the importance of giving students 'white space'. They said providing space for students to make notes was 'likely to be more effective at promoting effective learning by doing'. (7, 8)

Still others suggested that written information should include a clear list of aims and objectives

and what will happen week by week, and that assignment material 'should indicate what exactly the student will achieve upon its completion, and have a set of assessment criteria for the student to chart his/her progress through the course, making the study guide one of the strategies for increasing academic success of students even with limitations. (9)

Little is known about the students' perceptions about use of the study guide in United Arab Emirates. This study will analyze the students' perceptions about study guide and how the use of them influenced their satisfaction. The use of study guide in education is getting importance and which can make a major contribution to learning.

### **Objectives:**

1. To analyze the students perceptions about study guides.
2. To share the experience of development of study guide for Biochemistry course at RAK Medical & Health Sciences University.

### **Materials and Methods**

This cross-sectional study was carried out at RAK College of Medical Sciences (RAKCOMS), Biochemistry department and comprised of 1st year medical students. These students were following a system based, hybrid curriculum, which is horizontally integrated with Anatomy, Physiology and Biochemistry. Problem based learning (PBL) combined with limited number of lectures and most of the sessions were conducted as of active learning with practical laboratories in order to help the students to develop a flexible, integrated knowledge base in their preclinical phase.

A total of 98 first year MBBS students were included in this study. A 10 items survey questionnaire was developed after the literature review and discussion with the faculty and staff. Most of the questions were close-ended type. After obtaining permission from the institutional ethics committee, pre-validated survey questionnaire was administered to first year MBBS students to know the perception of students about study guide.

Data analysis was done separately for each questionnaire using descriptive statistics. For multiple comparisons between the groups, one sample Kolmogorov-smirnov test was applied. A p value <0.05 was considered as significant.

**Results**

There were 60 (61%) females and 38 (39%) males. More than (90%, p<0.001) of students had an opinion that study guide provided a proper introduction to the course. About (78.57%, p<0.001) felt it was informative. Majority of the students opined that study guide helped them to

plan their study (69.39%, p<0.001) with timely preparation for the exams (67.71%, p<0.001), provided greater support for their studying (90.72%, p<0.001).

Only (66.67%, p<0.001) students agreed for study guides as inspiring and motivating them.

Majority (70.65, p<0.001) of them often refer study guides, and (84.95, p<0.001) opined there is necessity of study guides in the courses they study (Table -1).

**Table-: 1 Showing the results of students’ perception on Study Guide:**

Demographics:	Males (Total 38)		Females (Total 60)		Total %		One sample Kolmogorov- Smirnov test
	Yes	No	Yes	No	% Yes	% No	
<b>Name:</b>							
<b>Study guide</b>							
1. Helped you to get Introduce to Biochemistry course.	35	3	57	3	93.88	6.12	0.001
2. It was Informative and encouraged you to interact with the course	28	10	49	11	78.57	21.43	0.001
3. Helped you to plan the study of the course	26	12	42	18	69.39	30.61	0.001
4. Helped you to Prepare for examinations	25	11	40	20	67.71	32.29	0.001
5. Inspired and motivated you to study the course	22	14	40	17	66.67	33.33	0.001
6. Have you used study guides before	19	19	35	25	55.10	44.90	0.001
7. How often you refer to the study guides	20	13	45	14	70.65	29.35	0.001
8. Do you think they are not necessary	11	26	3	53	15.05	84.95	0.001
9. Do you recommend that all courses should have study guides	32	5	57	3	91.75	8.25	0.001
10. Do you agree "Study guides provide greater support for you when studying?"	33	5	55	4	90.72	9.28	0.001

## Discussion

Study guides provides an alignment of learning outcomes, teaching methodology and assessment helps to make the overall learning experience more transparent and meaningful for the students.

In our study more than 90% of the students use the study guide and they liked the content in it and appreciated the presence of learning outcomes. This is in accordance with following studies,

According to Babar S, et al the perception about the usability of study guide was well appreciated by both students and teachers. (11)

According to Shazia et al the perception about the use of study guide as a learning tool was appreciated by students.(12)

This study reported that incorporation of learning outcomes in the study guide was useful for the students. (8, 9)

Using the study guide was rated as a suitable method; thus, it can be used to help students in the efficient use of training time.

Lesser response of students (66.67%,  $p < 0.001$ ) agreed for study guides as inspiring and motivating them, suggests that guidance is required in the preclinical years for the proper usability of these guides.

Perception of the students as well as feedback from the faculty will form the basis for implementing modifications in the study guide and thus helping the students to improve their learning.

Other studies have also emphasized that the study guide must be attractive and student-friendly. Based on the feedback from the students and the faculty the study guide can be made student friendly and attractive (8, 9)

There was no significant difference in perception between student groups (Females and Males) which may be due to familiarity among the both groups with the use of the study guide.

Guideline / steps to prepare study guide:

Step-1 Content analysis (Total Theory and Practical sessions).

Step-2 Determination of learning outcomes (LO).

Step-3 Appropriate time duration to deliver that topic (1hr or 2hrs)

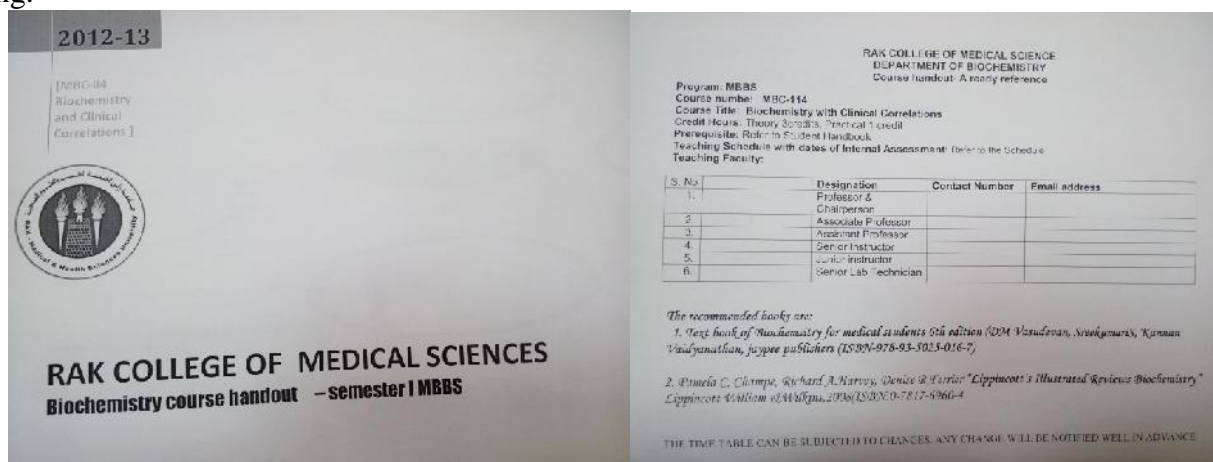
Step -4 Faculties who is going to deliver it

Step-5 Assessments planned during the semester or year (Follow the Academic calendar)

### Sample of the study guide:

What Study Guides contain at Biochemistry department at RAKCOMS:

1. Cover page having university logo
2. Program
3. Course number
4. Course Title
5. Credit Hours
6. Teaching faculty and staff details
7. Attendance
8. Teaching Schedule with dates of Internal Assessment
9. Learning outcomes
10. Recommended books and Reference books



*The reference books are:*

1. Collins Smith, Allan D, Marks, Michael Lieberman, "Marks' Basic Medical Biochemistry: A clinical approach" Cappworth Williams of Williams, 2nd Edition, 2005. (ISBN-11-978-0-7818-3349-7)
2. Michael Lieberman, Allan D, Marks, Collins Smith, "Marks' Essential Of Medical Biochemistry: A clinical approach" Cappworth Williams of Williams, 2007. (ISBN-11-978-0-7818-3349-8)

**ORIENTATION & GUIDELINES**

**TEACHING SESSIONS**

1. The department of Biochemistry strongly believes in the student centered curriculum and employs unique and innovative techniques to make each session highly interesting.
2. The course handbook is provided to give details of the teaching sessions with topic outline, dates & time for assessment.
3. The active participation in all the sessions is highly appreciated.
4. The dates for events such as *quizzes* and assignments are announced, you need to give you adequate time for preparation.
5. At the end of each session, handouts will be available for your reference as the interest.
6. The faculty will be available till 4:00pm for clarification of any queries.
7. Attending all classes will facilitate your learning process. It will make learning much easier, understandable and enjoyable.

**ATTENDANCE:**  
For the attendance guidelines kindly refer to the student handbook.

**SKILLS TRAINING- LAB SESSIONS (Practical)**

1. The handbook for skill training is kept in the library for your reference.
2. The observation and inference to be recorded using a pen, wherever required.
3. At the end of the each practicals session, the students are expected to get the signature from faculty.
4. The maintenance of records should be tidy, and in time.

**IF ANY CHANGE IN TEACHING OR ASSESSMENT THE STUDENT WILL BE INFORMED PRIOR. PLEASE REMEMBER! Assessment submission on time will ensure maximum marks.**

THE TIME TABLE CAN BE SUBJECTED TO CHANGES. ANY CHANGE WILL BE NOTIFIED WELL IN ADVANCE.

**RAK COLLEGE OF MEDICAL SCIENCES**  
**DEPARTMENT OF BIOCHEMISTRY Semester 1 (2012-2013)**  
**TEACHING SCHEDULE FOR M.B.B.S Course number MBC 114**

WEEK	DATE	TIME	Teaching Methodology	TOPIC	Topic Outline	FACULTY
WEEK 1	16/05/12			<b>Orientation and Registration</b>		Dr Faculty
	23/05/12	8:30-9:30am	Self (Case Based Learning)	<b>Basic Concepts</b>	Structure and functions of plasma membrane, cytoskeleton, nucleus, endoplasmic reticulum, Ribosome, Golgi apparatus, Peroxisomes & lysosomes.	
	24/09/12	10:15am-12:45pm	Practical	Laboratory Glassware and Reaction of Carbohydrates	Handing of glassware and Qualitative reactions of Carbohydrates	
	26/09/12	8:30-9:30am	CBL	Relation ship between Cell Biology and Biochemistry 2	Cell transport and diseases	

THE TIME TABLE CAN BE SUBJECTED TO CHANGES. ANY CHANGE WILL BE NOTIFIED WELL IN ADVANCE.

27/09/12	09:30-10am	Lecture	Structure and properties of carbohydrates	Definition, nomenclature, classification, formation, properties of mono, di, and polysaccharides
<b>Weekly learning outcomes:</b> At the end of the session the students shall be able to:				
<ol style="list-style-type: none"> <li>1. Relationship between Cell Biology and Biochemistry-1. Identify and describe the different subcellular organelles along with their biochemical composition, functions and factor associated with it.</li> <li>2. Relationship between Cell Biology and Biochemistry- 2. Compare and discuss the mechanism of transport across the cell membrane based on the source of energy driving the process and the molecular pathway for diffusion (Passive), active transport and facilitated solvent transport mechanisms, in detail.</li> <li>3. Structure and properties of carbohydrates.                     <ul style="list-style-type: none"> <li>Classify carbohydrates and give suitable examples (glucose, lactose, and glycogen) of each group.</li> <li>Describe the molecular structure and chemical properties of carbohydrates.</li> </ul> </li> <li>4. Demonstrate the skills of clinical chemistry laboratory.                     <ul style="list-style-type: none"> <li>Understand and learn the clinical chemistry Laboratory discipline.</li> <li>Usage of basic glassware and instrumentation.</li> <li>Do's and don'ts in the laboratory.</li> <li>Precautions and safety measures (Practical)</li> </ul> </li> </ol>				

THE TIME TABLE CAN BE SUBJECTED TO CHANGES. ANY CHANGE WILL BE NOTIFIED WELL IN ADVANCE.

10/10/12	01-02/12	10:45am-12:45pm	Practical	Reaction of Proteins	Proteinase reactions of proteins
WEEK-2	02/10/12			<b>PLACEMENT TESTS IN ENGLISH &amp; ARABIC</b>	
	03/10/12	0:30-5:00am	CBL	Carbohydrate Derivatives and Glycosaminoglycans	Physiologically important sugars, sugar acid, sugar alcohol, inorganic glycoside, Glycosaminoglycans
	05/10/12	8:30-9:30am	Lecture	Classification of Lipids Physiological Importance of Fats, Phospholipids	Simple, Derived Lipids (Lipids), Classification of fatty acids, Mono unsaturated, Saturated and Liposome, Classification, Structure and Clinical Importance
<b>Weekly learning outcomes:</b> At the end of the session the students shall be able to:					
<ol style="list-style-type: none"> <li>1. Carbohydrate Derivatives and Glycosaminoglycans:                     <ul style="list-style-type: none"> <li>Define and list the physiological functions of glycosaminoglycans (GAGs).</li> <li>Justify the clinical importance (Hyaluronic Acid, Chondroitin and Ds, Heparin) of glycosaminoglycans.</li> </ul> </li> <li>2. Translate the knowledge in understanding the concept of non fitting systems in hypothyroidism (CBL)</li> <li>3. Correlate the enzyme deficiencies to Lysosomal storage disorders (Self-directed learning)</li> </ol>					

THE TIME TABLE CAN BE SUBJECTED TO CHANGES. ANY CHANGE WILL BE NOTIFIED WELL IN ADVANCE.

## Conclusion

Overall, the students appreciated the importance of the study guide with learning outcomes in their learning process. As learning outcomes represents one of the essential building blocks for transparency within higher education systems and qualifications.

The content of the study guide will be reviewed and modified based on the feedback from the students. Also, feedback from the student attitudes on study guide provides timely and valuable feedback on curricular changes.

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## References

1. Grunert, J. The Course Syllabus – A Learning-Centered Approach. Boston, MA: Anker Publishing Company, 1997.
2. Bologna Working Group, p.18 (December 2004)
3. Forsyth I, Jolliffe A and Stevens D. Practical Strategies for Teachers, Lecturers and Trainers. Sterling, VA: Stylus Publishing, 1995.
4. 1998 Gareth J. Holsgrove, joel h. Lanphear & Iain mca. Ledingham Medical Teacher, Vol. 20, No. 2
5. AMEE Medical Education Guide No 16: Study guides-their use and preparation R.M. harden, J.M. laidlaw, e.a. hesketh
6. Diamond RM. Designing & Assessing Courses & Curricula: A Practical Guide. San Francisco: Jossey-Bass, 1998.
7. Holsgrove, G, J, Lanphear, J.H & Ledingham, I.Mc A. "Study guides: an essential student learning tool in an

- integrated curriculum". Med Teach 1998; 20: 99-103.
8. Harden RM, Laidlaw JM &Hesketh EA. AMEE Medical Education Guide, No.16. Study Guides: their use and preparation. Med Teach 1999; 21: 248-65.
  9. Laidlaw JM, Harden RM. What is study guide? Medical Teacher. 1990; 12: 7-12.
  10. Conderman G, Bresnahan Val. Study Guides to the Rescue. Intervent School Clinic 2010; 45: 169-76.
  11. Babar S Baig L. Study guide usability survey: perception of students and teachers of an undergraduate medical college. J Pak Med Assoc. 2014 Oct;64(10):1114-8.
  12. Shazia Babar, Study guides: perception of students about study guides in an undergraduate medical college AEME Conference 2013 and 16th AKU symposium, Agha khan university Pakistan theme curriculum-teaching and learning)
  13. Dilara. Ka, Latha Ravichandranb, Abirami. Va, Vijayaraghavan. P.Vc "Student perception on study guides in an integrated preclinical curriculum" Sri Ramachandra Journal of Medicine, July-Dec 2014, Vol.7, Issue 2

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