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American University in Cairo

Graduate School of Education

Constructivist and Cognitive Multimedia Learning Theories as Tools for Training Teachers on How to Integrate Technology Using the TPACK Framework for Teaching Arabic Online

A Thesis Submitted to

The Department of International & Comparative Education

in partial fulfillment of the requirements for

the degree of Master of Arts

by **Rasha Essam**

Under the supervision of Dr.Russanne Hozayin

January, 2016

The American University in Cairo

Graduate School of Education (GSE)

Constructivist and Cognitive Multimedia Learning Theories as Tools for Training Teachers on How to Integrate Technology Using the TPACK Framework for Teaching Arabic Online

A Thesis Submitted by

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Submitted to the Department of International & Comparative Education

December, 2015

In partial fulfillment of the requirements for
The degree of Master of Arts
in Educational Leadership

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Table of Contents

Acknowledgment 3
List of Figures 6
List of Tables 7
Abstract 8
Chapter 1: Introduction 9
Chapter 2: Literature Review 12
Teachers' attitudes towards technology in general 12
Teachers' attitudes towards technology professional development programs 13
Theoretical framework (TPACK) 15
Different uses of the TPACK framework 18
Constructivist learning theory 19
About Constructivist learning theory 19
Constructivist learning theory in empirical studies 25
Cognitive theory of multimedia learning theory (CTML) 27
About CTML 27
About CTML in empirical research studies 29
Rationale for using the TPACK 31
Conceptual framework 34
Chapter 3: Methodology 38
Research Questions 38
Research Context 38
Researcher's Position 39
Epistemological Position 39
Work Position 40
Participants 40
Ethics 41
Research Design 41
Comparison between different research methodologies 41
Design-based Research 42
Data Collection Tools 44

Semi-structured Interviews....45
Survey....46
Performance Exam....46
Validity of the instruments....47
Procedures....48
Data Analysis and Coding Technique....50
Chapter 4: Results....53
Research Question 1....53
Research Question 2....55
Research Question 3....57
Results for sub question 1....58
Results for sub question 2....59
Results for sub question 3....61
Results for sub question 4....62
Research Question 4....63
Chapter 5: Discussion and Conclusions....64
Theoretical Implications....65
Practical Implications....66
Limitations....66
Recommendations for future research....67
List of References....68
Appendix 1: Ethics Form....74
Appendix 2: IRB Approval....75
Appendix 3: Interview Questions....76
Appendix 4: Sample of Problem-based Activities....77
Appendix 5: Survey....78
Appendix 6: Performance Exam....80
Appendix 7: The Manual....83

List of Figures

Figure 1: Number of enrolled students 9

Figure 2: Scaffolding 22

Figure 3: Information retrieval.....23

Figure 4: Combination of representation 24

Figure 5: Concepts of CTML.....24

Figure 6: Multimedia modes.....28

Figure 7: Multimedia objectives 28

Figure 8: Types of learning.....29

Figure 9: Conceptual framework 34

Figure 10: Training scenario.....49

Figure 11: Survey results 57

Figure 12: Exam results 63

List of Tables

Table 1: List of Acronyms 10

Table 2: The interaction between the different components of the TPACK 16

Table 3: Evidence to show how I fit into the TPACK framework 31

Table 4: Comparison between different research methodologies 41

Table 5: Compatibility of the study with design-based research 43

Abstract

The purpose of this study is to explore the perceptions of trainees towards a professional development program. The target is to train teachers on how to use a learning management system called “Blackboard” for designing courses that could be taught online in the future. I used technological pedagogical and content knowledge as a theoretical framework (TPACK) for designing the training. The design of the professional development program took into consideration two learning theories—constructivist learning theory and cognitive multimedia learning theory as part of the pedagogy component of the TPACK framework. Design-based research with one contextual phase without subsequent interventions was used for conducting this study. Semi-structured interviews, a survey with closed ended questions, and a performance exam were used for data collection. The results are presented aligned with the study’s research questions and purpose. The findings showed positive attitude towards the professional development program as a whole and the manual and problem-based activities in particular, with some recommendations for further enhancement. The results of this study attempt to assist professional development designers in the design of other training programs. Finally, theoretical and practical implications are highlighted based on the discussion and conclusions drawn.

Keywords: Technological pedagogical and content knowledge, TPACK, TPCK, constructivist, problem-based learning, cognitive multimedia learning, CMLT, design-based research, mixed methods

Chapter 1: Introduction

The Arabic Language Instruction Department (ALI) in an American University in Cairo faced a major drop in students' enrollment after the 25th of January revolution that took place in Egypt in 2011. The number of students' enrolment started to decline due to the unstable situation in Egypt as shown by numbers in the graph below:

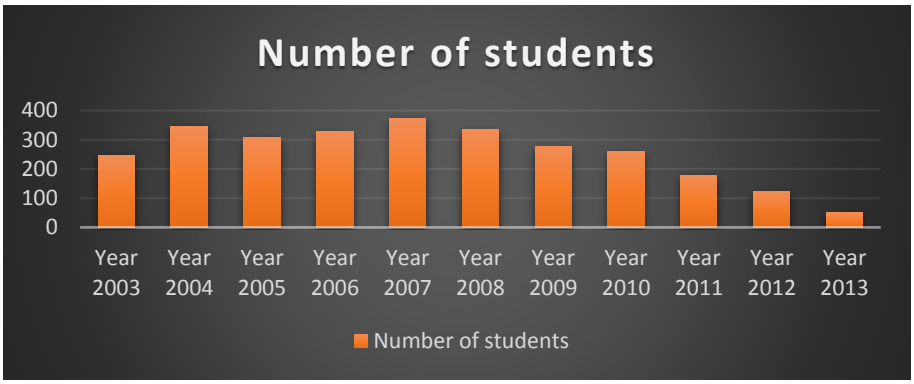

Figure 1: Number of enrolled students

Since then, the number of students continued to decrease especially after the second revolution in June 30, 2013. As a result, the need to find a solution, by reaching more students online evolved. However, according to my own experience as an insider in the target context, ALI teachers were not aware of how to use the learning management system of the university, namely, Blackboard. In fact, a pre-requisite for teaching online is to be able to use the learning management system to design courses. Accordingly, the main purpose of this research is to enable teachers to use Blackboard in order to be able to design courses for teaching Arabic online in the future. I consider this study to be one phase in a series of expected future professional development programs which will help enable teachers to teach Arabic online.

Having said that, it was important to find a theoretical framework for designing the professional development program. Koehler and Mishra (2006) created the technological pedagogical and content knowledge (TPACK) as a theoretical framework for training teachers on how to use technology pedagogically. This framework focuses on the knowledge of: technology, pedagogy, and content.

Koehler and Mishra (2006) talked also about the need for having deeply skilled teachers who are capable of using technology effectively in their teaching. As a result, teachers who use TPACK should understand the concepts of using technology through pedagogical techniques in order to use technology in a constructive way to teach the target content. In addition, teachers should know how to use technology in order to meet students' needs and try to help them solve their problems.

Before designing the training using the TPACK framework, it was important to review the literature regarding: teachers' attitudes towards technology in general; teachers' attitudes towards technology professional development programs; and teachers' needs. The main reason for this review is to know what to focus on in a training program and what to avoid in designing the training in order make the most of the strengths and weaknesses of previous professional development programs for teachers in relation to technology.

To assist the reader, a list of all the acronyms used in this research study is contained in Table 1.

Table 1: List of Acronyms

Acronym	**Full name**
TPACK	Technological pedagogical and content knowledge

PCK	Pedagogical content knowledge
CTML	Cognitive theory of multimedia learning
ALI	Arabic language instruction department
LMS	Learning management system

Chapter 2: Literature Review

This chapter is divided into six sections. The first section focuses on teachers' attitudes towards technology in general. The second section focuses on teachers' attitudes towards technology professional development programs and the third section focuses on teachers' needs. The fourth, fifth, and the sixth sections are related to the TPACK framework, constructivist learning theory, and CTML.

Teachers' attitudes towards technology in general

Many researchers have been interested to know more about teachers' attitudes towards the use of technology, including: Cavas, Canas, Karaoglan, and Kisla (2009); Ham (2010); Hermans, Tondeur, Braak, and Valcke, (2008); Hu, Clark, and Ma (2003); Koc and Bakir, (2010); and Teo (2010). Among the findings reported in these study was that numerous factors affected teachers' attitudes, such as perceived usefulness, ease of use, subjective norm, behavioural control, facilitating conditions, attitudes towards its use, and behavioural intention for using it (Teo, 2011). Each terms is defined as follows.

Perceived usefulness is the extent to which teachers believe that the use of technology will enhance their performance in classrooms (Davis 1989, as cited in Teo, 2011).

Ease of use is the extent to which teachers exert effort to accomplish certain tasks. (Davis 1989, as cited in Teo, 2011).

Subjective norm is the extent to which teachers are affected with the opinions of others with respect to their use of technology (Fishbein & Ajze, 1975, as cited in Teo, 2011).

Behavioural control is the extent to which teachers perceive the effort exerted to perform certain tasks using technology (Ajzen, 1991, as cited in Teo, 2011).

Facilitating conditions is the extent to which teachers view the factors that affect their use of technology in the environment (Thompson et al., as cited in Teo, 2011).

Attitudes towards the use of technology is the extent to which teachers have positive or negative feeling towards the use of technology (Fishbein & Ajze, 1975, as cited in Teo, 2011).

Behavioural intention is the extent to which teacher is willing or unwilling to use technology (Davis 1989, as cited in Teo, 2011).

Moreover, it is important to highlight the fact that the support given to teachers affect their beliefs towards the use of technology (Ham, 2010). Perceived usefulness regarding the use of technology has a direct effect on teachers' beliefs as well (Hermans et al., 2008). Technological complexity and infrastructure affect teachers' willingness to use or not to use technology (Hu et al., 2003).

Teachers' attitudes towards technology professional development programs

In addition to the factors stated above, other empirical researchers were interested in knowing more about teachers' attitudes towards technology professional development programs. For example, Uslu and Bumen (2012) showed that professional development courses did not change their negative attitude towards using technology since there was a deficiency in the organizational support. In addition, there was a disconnect between the technology workshops and the rest of the teacher preparation program because there was no perception of its being an authentic experience (Sutton, 2011). There was also a disconnect between the technology course

and the teaching theories and methods. As such, teachers felt that there was insufficient exposure to the appropriate use of technology tools in their learning experience.

Moreover, training methodologies used for equipping them with the appropriate technology has a direct effect on their attitudes towards using technology (Koc & Bakir, 2010). Finally, relevance of the technology to what teachers do in real life inside the classroom affects their integration of technology as well (Teo, 2010). This leads us to the fact that teachers are still cautious regarding using technology in education (Moore-Hayes, 2011). As a result, knowing their needs is another important aspect that should be investigated before designing the training.

Teachers' needs

Based on the findings from recent research studies regarding teachers' attitudes towards professional development technology programs, this section sheds light on recent literature in order to know teachers' needs.

Different needs were highlighted in a number of recent empirical research studies. For example:

- There is a need for having effective programs capable of changing teachers' understandings and practices regarding technology integration (Ham, 2010).
- There is also a need for providing teaching with the learning outcomes in order to make it clear for them to know what they should really expect after finishing a certain program (Ham, 2010).
- Teachers need a context designed in a constructivist way (Matzen and Edmunds, 2007).

- Teachers need a student-centred program where collaboration between students occurred in a friendly environment (Matzen and Edmunds, 2007).
- Teachers need an environment where cognitive and emotional aspects are taken care of (Avalos, 2011).
- Teachers needs to consider their different needs and objectives while designing a professional development program since teachers have different needs and different levels of knowledge (Avalos, 2011).

Accordingly, it is important to investigate their needs and fulfil them in an effective and innovative way through different ways such as: mutual learning, networking, and resource sharing (Duran, Brunvand, & Fossum, 2009 and Masood, 2010). Pool, Reitsma, and Mentz (2013) highlighted the fact that teachers should be knowledgeable in three main components, which are: 1) technology, 2) pedagogy, and 3) content. The reason behind that is to be enable them to use technology effectively in a pedagogical way while knowing the content well. This leads us to the next section, which focuses on the technological pedagogical and content knowledge as a theoretical framework used for guiding the professional development program of this study.

Theoretical framework (TPACK)

The technological pedagogical and content knowledge framework (TPACK) is built on Shulman's pedagogical content knowledge framework (PCK) (Shulman, 1986, 1987, as cited in Koehler & Mishra, 2008). The TPACK framework added the technological component to it. It includes three main components, which are technology, pedagogy, and content. The three

components interact together to form seven combinations. Koehler and Mishra (2008) defined the seven combinations as shown in the table below:

Table 2: The interaction between the different components of the TPACK

Number	Combinations	Description
1.	CK	It is the knowledge about the actual subject that is to be learned or taught.
2.	PK	It is the knowledge about the methods of teaching and learning. That includes educational purposes, values, and aims.
3.	PCK	It is the knowledge of pedagogy that is related to a specific content.
4.	TK	It is the understanding of information technology to be able to apply it productively at work with a continuous adaptation to its changes.
5.	TCK	It is an understanding of the relationship between technology and content and how do they affect each other with respect to application.
6.	TPK	It is the understanding of how teaching and learning change with the use of certain technologies.
7.	TPCK	It is the understanding that emerges from the interaction between the knowledge of content, pedagogy, and technology.

This framework stresses the importance of being aware of the appropriate technology used for teaching specific subjects (Kinchin, 2012). The pedagogy used for teaching the subject is also another important aspect in selecting the correct type of technology tools (Kadijevich, 2012).

A literature review by Matherson, Wilson, and Wright (2014) highlighted the importance of using TPACK in order to guide teachers in developing effective lesson plans and classroom

instructional material. Ten points were recommended by Matherson et al. (2014) in order to have an effective professional development workshop based on TPACK, as follows:

1) Use simple language to communicate with teachers and avoid difficult technical terminologies.
2) Support teachers in building their knowledge and skills.
3) Provide teachers with opportunities for engaging in leadership roles.
4) Create and encourage the occurrence of a community of practice.
5) Model real scenarios used between teachers and students through problem based activities.
6) Encourage teachers to assess themselves frequently through reflection in order to be aware of their points of strengths and weaknesses for further enhancement.
7) Link practice to teaching pedagogies used inside the classroom between teacher and students.
8) Encourage teachers to collaborate within the same school in order to learn from each other.
9) Encourage teachers to integrate it in a natural way in the daily life of the school.
10) Encourage teachers to use frequently for sustainability so that their effect last for a longer period.

In addition to the above, different research studies gave trainings to teachers to enable them use TPACK in their teaching, such as those done by: Collins and Liang (2014); Fook, Sidhu, and AbdulAziz (2011); Hismanoglu (2012), Oster-Levinz and Klieger (2010); Kohen and Kramarski (2012); Sun (2011); Sang, Valcke, Braak, and Tondeur (2010); and Yaman (2010). The findings of these research studies acknowledged the effectiveness of TPACK in raising teachers'

awareness towards connecting the knowledge of technology, pedagogy, and content for the aim of using technology effectively in teaching. Based on these findings, I am using the TPACK as a theoretical framework for training participants. However, I am not training teachers to use the TPACK as previous studies have done. Here, I am using it in when designing the professional development program, which is a different use from most previous research. In the next section, I discuss why this use is an important one for TPACK.

Different uses of the TPACK framework

In this section, I will talk about the different uses of the TPACK framework as highlighted in a recent peer-reviewed article published in 2013. The literature review was conducted by Voogt, Fisser, Pareja Roblin, Tondeur, and van Braakt (2013). They found that recent empirical research studies focused on the use of TPACK from the following perspectives: 1) measuring teachers' beliefs; 2) measuring pre-service teachers' use of TPACK; and 3) strategies for developing teachers' use of TPACK.

Based on that, none of them used it as a theoretical framework for designing a training for training participants on how to use technology. In addition, it was always used with K-12 instructors and rarely with instructors in higher education (Dysart & Weckerle, 2015). This is considered a gap in the use of the TPACK.

In my own point of view, in order to convince teachers to use technology effectively, the trainer should be able to use certain pedagogical techniques that enable him/her to train others on using technology. These pedagogical techniques should take into consideration teachers' needs as previously stated in section 2.3. In fact, my point of view was also advocated by other researchers like Dysart and Weckerle, (2015). For example, they stated that most professional

development trainers lack the pedagogy that enable them to train others effectively. For evidence, here is a quote taken from their article: “Training that isolates each of these types of knowledge, such as workshops about a specific technology or pedagogical strategy, often fail to adequately cultivate the specialized knowledge of how technology and pedagogy interact with each other and within specific content areas. To accomplish this, workshops should provide meaningful and relevant activities in a contextualized environment.”

In light of the above, in this research study, I used the TPACK framework for training teachers using two learning theories as parts of the pedagogical part of the TPACK. The two learning theories are constructivist learning theory and the cognitive theory of multimedia learning. The next two sections explain them in details with evidence from empirical research studies.

Constructivist learning theory

About Constructivist learning theory

Before going into the details of the constructivist learning theory, I want first to introduce the beliefs of all learning sciences. All learning sciences agree on five main concepts (Woolfolk, 2014). They believe that there are experts who are knowledgeable about certain facts, but knowing them alone will not make them experts. What really matters is knowing how to use them in different situations in order to solve problems. As a result, they are capable of becoming flexible in order to solve problems in certain contexts.

The second point which learning sciences agree upon is that learning comes from the learner. In other words, transferring information from the teacher to the learner will not lead to effective learning, but to the contrary, the learner should know how to use information and build

upon his/her own knowledge (Schunk, 2008). The third point concerns the learning environment. An effective learning environment is an important aspect that leads to learning (Woolfolk, 2014). For example, it is important to provide an active learning environment to help enable learners apply what they learn inside the classroom in real life.

Furthermore, knowing learners' prior knowledge is another key important point that is agreed upon among all learning sciences. For example, it is very important to know learners' prior knowledge in order to build upon it without distortion. Finally, it is important for learners to reflect on their own learning through different means such as conversation, portfolios, reports, or drawings in order to develop a deep conceptual knowledge (Woolfolk, 2014).

Having highlighted the main concepts which virtually all learning theories agree upon, I, will now elaborate further on the constructivist learning theory in specific.

According to Woolfolk (2014), constructivist learning theorists agree on the following:

- Learning occurs in a relevant learning environment.
- It encourages social interaction and shared responsibility in learning settings.
- It represents information in multiple forms for the ease of learning.
- It raises the awareness among learners that knowledge is constructed.
- It encourages the feeling of ownership in learning.

In addition, they believe that there are two forms of constructivism: 1) psychological construction, and 2) social construction (Woolfolk, 2014). The first one focuses on the use of resources, information, and peers in order to enhance their problem solving skills, while the second one focuses on the interaction among individuals in an activity for reaching something meaningful in their culture.

Constructivist learning theories have different teaching strategies such as problem-based learning, inquiry-based learning and service learning. According to constructivists, each problem can be solved in different ways, so there is no one single solution for a problem. These problems are recommended to be presented in the form of authentic tasks (Woolfolk, 2014) like the real situations, which learners could face in reality. During problem solving activities, learners need scaffolding as a form of support and that could occur through their teacher and/or peers (Schunk, 2008). Teachers can help them through breaking the problems into chunks or through providing them with resources (Woolfolk, 2014).

Moreover, Vygotsky highlighted the importance of social interaction and multiple representation of content (Woolfolk, 2014). For example, Mark Windschitl (2002, as cited in Woolfolk, 2014) suggested a number of activities for such interaction to occur. For example, teachers can provide learners with different resources or tools (conceptual and/or technological) that can facilitate their learning.

Constructivist learning theory believes in the importance of scaffolding. They state that it is needed in order to engage students in the zone of proximal development through problem solving activities as suggested by Vygotsky (Woolfolk, 2014). Zone of proximal development is when learners build their knowledge through solving problems with their peers. This concept is developed by Vygotsky to show that learning focuses on culture and cognition.

There are three types of scaffolding, which educational psychologists agreed upon such as contingency support, fading, and transferring responsibility (Woolfolk, 2014).

Figure 2: Scaffolding

The teacher uses contingency support in order to tailor and adjust learners' responses. In addition, s/he uses fading in order to withdraw when the learner deepens his/her own knowledge. Finally, the teacher uses transferring responsibility in order to give learners the responsibility of their own learning (Woolfolk, 2014).

It is prominent to mention that the roots of problem-based learning return to John Dewey (Woolfolk, 2014). Problem-based learning is used in order to encourage students find solutions to real problems. The goal from using problem-based learning is to increase learners' intrinsic motivation, collaboration, and autonomous learning.

As previously stated, constructivist learning theory has roots in the cognitive perspectives. As a result, constructivists are interested in knowing how information is processed, remembered and retrieved (Woolfolk, 2014). In other words, the individual, through the working memory, perceives information. As a result, the question that arises now is "How can we represent this information in a way that makes it easy for the individual to process and acquire?"

Allan Paivio's dual coding theory (Paivio 1986, 2006 and Clark & Paivio, 1991, as cited in Woolfolk, 2014) talked about the representation of information both in the form of words and

images. Psychologists such as Butcher (2006, as cited in Woolfolk, 2014) believes that information when presented like that becomes easier to learn and it is stored in the long-term memory. That is also advocated through Mayer's (2001) cognitive theory of multimedia learning.

Retrieving information according to cognitivists focuses on four main strands: organisation, elaboration, imagery and context. These four strands play an important role in having the information stored more in the long-term memory (Woolfolk, 2014).

Figure 3: Information retrieval

For example, elaboration is essential because it adds meaning to new information by connecting it with existing knowledge. As a result, learners find it easier for them to learn since knowledge is constructed gradually. In addition, organisation and chunking are other essential elements for improving learning. Organisation makes it easier for the learner to process information easily and so does chunking because it divides large pieces of information into smaller parts making it easier for learners to acquire something new (Woolfolk, 2014).

Imagery is another important aspect for the ease of learning. For example, Mayer (2001) studied the combination of representing words and pictures for a number of years and he concluded that the right combination could cause a better learning especially for older students.

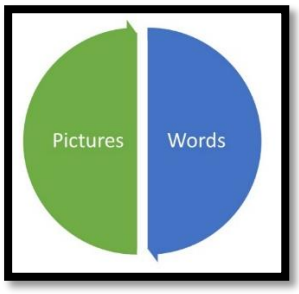

Figure 4: Combination of representation

Mayer's (2001) cognitive theory of multimedia learning embraces three ideas as follows:

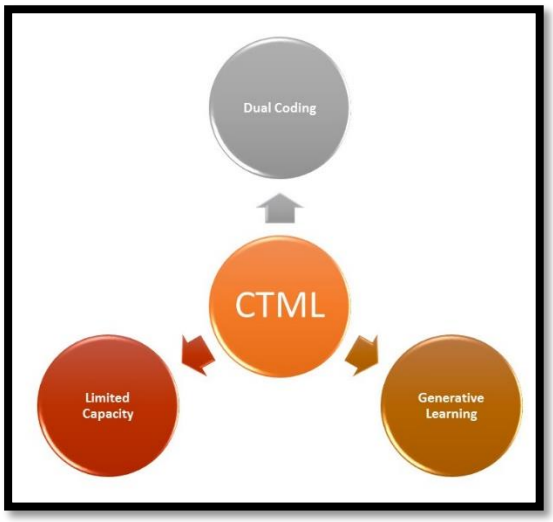

Figure 5: Concepts of CTML

- Dual coding: Both visual and verbal material are represented (Clark & Paivio, 1991, as cited in Woolfolk, 2014).

- Limited capacity: Working memory has a limited capacity, so cognitive load is an essential aspect to be taken into consideration (Baddeley, 2001, as cited in Woolfolk, 2014).
- Generative learning: Learning occurs when students connect information and focus only on the relevant information (Woolfolk, 2014).

Finally, the context, which is the fourth element that influences learning embraces both the physical and emotional components. For example, the context can include certain people in a certain place at a specific time. Therefore, it is said that learners recall information easily when they are placed in the same context (Ashcraft & Radvansky, 2010, as cited in Woolfolk, 2014).

Having described the main concepts of the constructivist learning theory, the next section focuses on the findings of recent empirical studies that depended on it in their studies.

Constructivist learning theory in empirical studies

Constructivist learning theory focuses on the social interaction occurring in the learning process within a certain environment through collaboration, encouragement, scaffolding, and mentoring (Amarin and Ghishan, 2013; Ayas, 2006; Chitanana, 2012; and Gold, 2001). The findings showed that the social interaction and challenging problems are considered the main elements of effective learning (Gilakjani and Ismail, 2013 and Gold, 2001). This theory looks at the classroom as a community where learners engage in problem solving activities, conversations, negotiations, and reflections (Karagiorgi and Symeou, 2005, and Amarin and Ghishan, 2013).

Several empirical studies were interested in this approach such as those done by: Curran, Carlson, and Celotta (2013); Etherington (2011); Hartfield (2010); Kuruganti, Needham, and

Zundel (2012); Mondahl and Razmerita (2014); and Wen (2011). For instance, Mondahl and Razmerita (2014) found that collaborative learning is supportive and conductive to successful problem solving since it leads to successful learning. In addition, students' focus towards problem solving motivated them towards connecting what they know to the real world. Curran, Carlson, and Celotta (2013) found also that collaboration and the real problem solving activities were effective for strengthening students' knowledge. Moreover, Kuruganti, Needham, and Zundel (2012) indicated that problems' level of difficulty has a positive effect on the learning process as well.

In addition to the above, Wen (2011) applied innovative teaching strategy to promote students' problem solving activities. The results showed that students' learning was fostered and students were able to come up with alternative answers. As a result, this approach made them think innovatively and critically towards the problems. Furthermore, Hartfield (2010) looked into constructivist teaching strategy through case-based learning activities to develop problem-solving skills, and consolidate student learning and understanding. Both the surveys and interviews showed that students perceived problem based learning as a way for reinforcing their skills. They mentioned that it facilitates constructive alignment of teaching and learning activities such as active engagement, motivation, autonomy, independence and responsibility. In addition, it fostered the development of creativity and problem-solving skills. Accordingly, these strategies developed, encouraged, and facilitated the construction of knowledge. It also promoted the creation of a learning environment where students are motivated to actively think and apply their knowledge. Finally, Etherington (2011) found also that collaborative knowledge construction and sharing fostered students' learning leading to having a positive impact on participants' motivation.

Having highlighted the positive findings of the constructivist learning theory in recent empirical studies, I found it appropriate to be used in the professional development program. The next section focuses on the cognitive theory of multimedia learning.

Cognitive theory of multimedia learning theory (CTML)

About CTML

This theory developed by Mayer (2001) states that learners understand better when the content is presented in pictures and words. In addition, he stated that this theory is more effective with learners of low knowledge and that occurs through presenting material through instructions that could facilitate the learning process (Mayer, 2009). Instructions as suggested by Mayer (2001) could be through: 1) selecting relevant material, 2) organizing the material in a coherent manner, and 3) integrating the material with previous and relevant knowledge.

Multimedia learning focuses on learning from both words and pictures. In addition, multimedia instructions refers to the learning that occurs based on presenting material in both pictures and words (Mayer, 2009). The text could be printed or spoken and the pictures could be static graphics or dynamic graphics. First, static graphics could be like photos, graphs, or illustrations. Second, dynamic graphics could be like videos and animations. Words could be like text or narration on screens.

Multimedia as stated by Mayer (2001) is based on: 1) delivery media; 2) presentation mode; and/or 3) sensory modalities. The delivery mode could be through a speaker or a computer screen. The presentation mode could be through pictures and words. Finally, the sensory modalities could be through auditory and visual (Mayer, 2009).

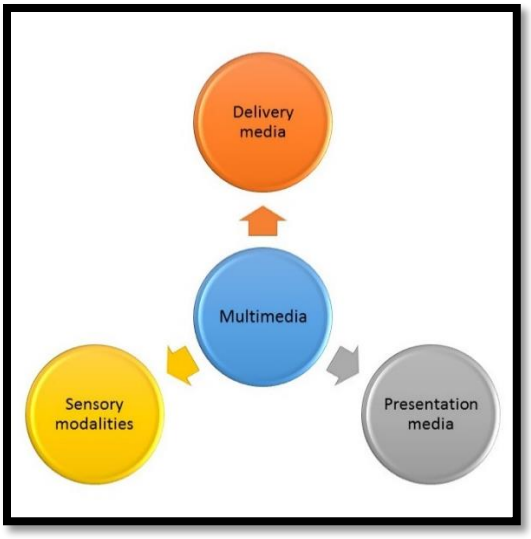

Figure 6: Multimedia modes

The design of the multimedia material is used in order to enhance learners' autonomous learning. In addition, it is used for: 1) response strengthening; 2) information acquisition; and/or 3) knowledge construction (Mayer, 2009).

Figure 7: Multimedia objectives

Response strengthening is used for practice. Information acquisition is used as a tool for delivering information. Finally, knowledge construction is used as a tool for helping learners construct knowledge and make sense of the meaning of that constructed knowledge.

Based on the above forms of multimedia uses, there are three types of learning that are expected to occur after using multimedia material. The three types of learning are: 1) no learning; 2) rote learning; 3) meaningful learning (Mayer, 2009).

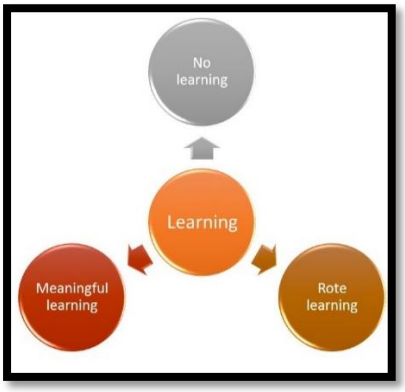

Figure 8: Types of learning

No learning means that the learner is unable to retrieve information and eventually unable to apply it practically in real life situations. Rote learning means that the learner can retrieve information but unable to apply it. Finally, meaningful learning means that the learner can retrieve and apply information effectively (Mayer, 2009).

Having highlighted the main concepts of the CTML, the next section shows with evidence how it succeeded in improving students' learning with respect to both information retrieval and information transfer.

About CTML in empirical research studies

Several research studies showed the success of this theory such as those done by: Ayres and Paas (2012); Domagk (2010); Frechette and Moreno (2010); Paik and Schraw, (2012)**;** Rey and Buchwald, (2011)**;** and Rau, Aleven, and Rummel (2014).

For example, among the studies that showed positive results from using multimedia as a supplementary material during learning are the ones done by: Gambari, Yaki, Gana, and Ughovwa, (2014); Kanar and Bell (2013); and Ljubojevic, Vaskovic, Stankovic, and Vaskovic (2014); Lin and Dwyer (2010); Leow and Neo (2014); Milovanovic, Obradovic, and Milajic (2013); and Tsai (2012).

The findings showed that the use of supplementary multimedia material in teaching reduced students' feel of the high cognitive load of information (Ljubojevic et al., 2014). In addition, it increased their achievement and retention (Gambari et al., 2014). It also lead to an improvement in the quality of student learning where meaningful interaction, better attention, increased retention, engagement, and autonomous learning occurred during the learning process (Leow and Neo, 2014).

In conclusion, more research studies done by Dembo and Seli (2012); Reeves (1998); and Shank (2005) stressed on the importance of using multimedia material in presenting information. They indicated that when multimedia-mediated content is incorporated into the learning environment, the information-rich presentations make the learning instructions more effective than presenting it through a single medium that leads to rote learning. As a result, students are expected to obtain the information more meaningfully and repeatedly through different media and choices. In addition, Kanar and Bell (2013); Lin and Dwyer (2010) ; Milovanovic, Obradovic, and Milajic (2013); and Tsai (2012) indicated that multimedia material when designed appropriately increases learners' autonomous learning and motivation.

Having provided evidence from recent empirical research studies concerning the positive effect of CTML in the presentation of material and its positive effect on both information retrieval and transfer, the next section focuses on the rationale behind using the TPACK. In

addition, it will show how I used the two learning theories in the pedagogical component of the TPACK framework.

Rationale for using the TPACK

In this section, I will show how I fit in the TPACK framework. The framework consists of three components: 1) technology, 2) content, and 3) pedagogy. Mishra and Koehler (2008) stated that teachers should be knowledgeable of the information technology to be able to apply it productively at work with a continuous adaptation to its changes. Since in this study, I am the teacher, researcher, and technical expert, I will show in the table below, how with evidence I am capable of using the TPACK framework in training the participants.

Table 3: Evidence to show how I fit into the TPACK framework

Number	Interaction between its components	Evidence
1.	**CK**	I am aware of Blackboard as I created a manual to show how it is used. In addition, I received a distinguished award from the dean of my school for creating this manual for helping teachers in using it.
2.	**PK**	I am aware of the teaching pedagogies because I am a holder of a Master degree in teaching Arabic as a foreign language and I am teaching in the target university since 2009.
3.	**PCK**	I worked as a technical writer for 15 years and I am aware of how to create helps and manuals to audiences of different levels of knowledge.

4.	**TK**	I have a BScs in computer science and information system and I took a number of courses in the Master degree of computer science as well, so I can adapt to any technology easily due to my background.
5.	**TCK**	In this research study, I am using backboard as a learning management system because it is the agreed upon tool for developing courses online in the university.
6.	**TPK**	I am a holder of Master degree in teaching Arabic as a foreign language and I also took a number of courses related to learning theories in the Master of international and comparative education in addition to having a BScs in Computer science and information system, so I am aware of both the technological and pedagogical knowledge.
7.	**TPCK**	Based on all the justifications listed in this table from number 1 to 6, I am capable of training participants using the TPACK framework.

The TPACK framework consists of three components as previously stated by Koehler and Mishra (2006). In this study, I am focusing on the TPACK, which is the interaction between the three components altogether. The technology and content that I want students to learn is a learning management system (LMS) called Blackboard. Learning management systems such as Blackboard and Moodle are systems used for delivering electronic content to students. In

addition, they provide teachers with interactive tools for managing students' learning (Woolfolk, 2014).

Concerning the pedagogy as highlighted in the literature review section, I used the constructivist learning theory and the cognitive theory of multimedia learning. The constructivist learning theory is used here as a learning theory in the pedagogical component of the TPACK. In this theory, I am using problem solving as an instructional approach. According to the literature reviewed so far, problem-based learning showed positive results since it connects knowledge learned to reality. In addition, it is a tool used for connecting what teachers learn with what they actually do, so constructivist-learning theory was found appropriate for these reasons.

Mayer's (2001) cognitive theory of multimedia learning was found suitable to be used as another learning theory of the pedagogical component of the TPACK because of two reasons. First, it uses pictures and words for presenting information in order to make it easier especially for low-knowledge learners to acquire information easily. In addition, it focuses on knowledge construction and that shows similarity between the CTML and the constructivist learning theory. In fact, it is worth highlighting that constructivist learning theory has roots in the cognitive learning theory (Woolfolk, 2014), so it is expected to have such overlap. That overlap encouraged me to use them together in the TPACK framework.

Having highlighted the rationale behind using the TPACK, the next section focuses on the conceptual framework.

Conceptual framework

In this section, I will present my conceptual framework, which is inspired from the definition of Koehler and Mishra (2008) regarding TPACK framework; Mayer's (2001) explanation of CTML; and constructivist learning theory as explained by Schunk (2008) and Woolfolk (2014).

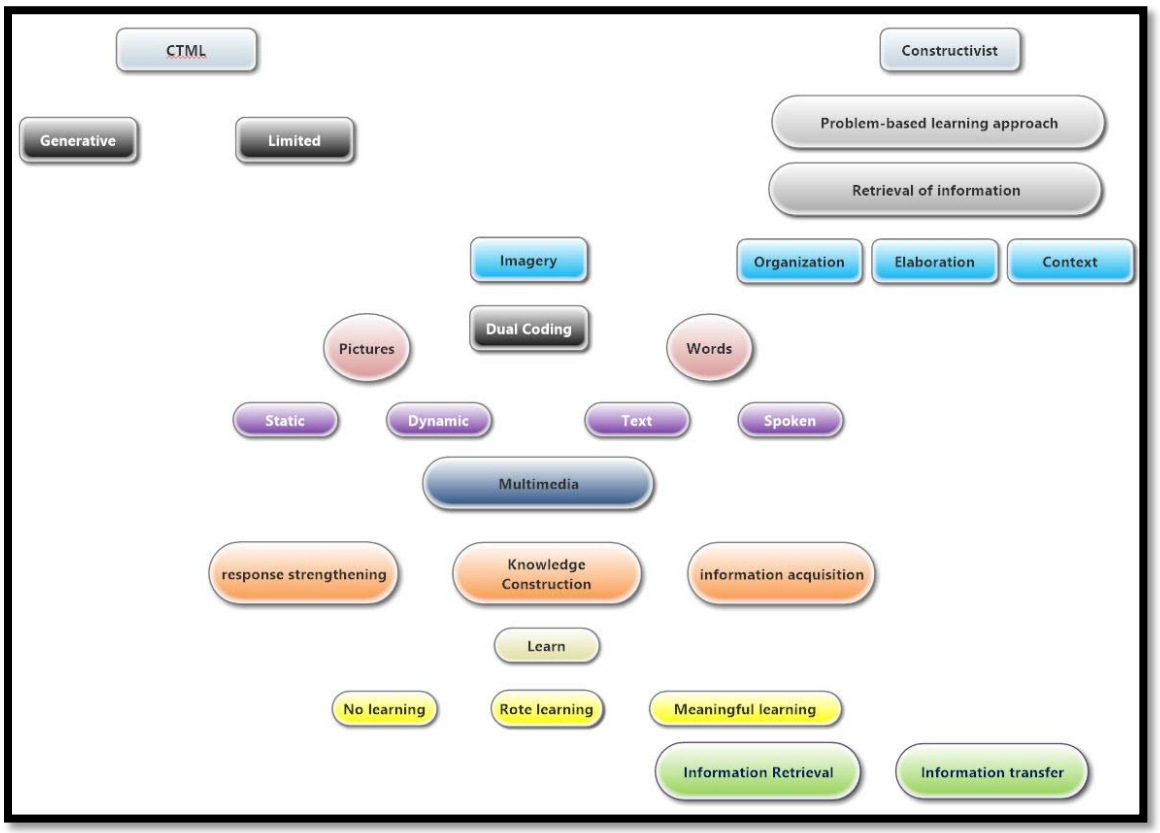

Figure 9: Conceptual framework

The above diagram reflects my concept regarding the connection between the TPACK and both the constructivist learning theory and the cognitive theory of multimedia learning. In order to use the TPACK framework, the pedagogy used in teaching should be suitable for both the technology used and the content presented. As a result, in this section, I will show this relationship. I used problem-solving activities as an instructional approach of the constructivist learning theory and I created an interactive manual based on the concepts of CTML.

Based on that, the two learning theories helped me in creating both the manual and the problem-solving activities.

The Manual

Firstly, the constructivist learning theory indicates that for learners' to be able to retrieve information, the teacher should take care of the following: 1) context; 2) elaboration; 3) organisation; and 4) imagery. In fact, the four components were used in introducing the manual to participants. For example, with respect to context, the manual was presented to participants in the computer lab, which is spacious and fully equipped with the latest technologies such as high internet connection, new computers, and a projector.

Concerning elaboration, links were added in the manual in order to link new information with previous ones leading to meaningful learning. With respect to organisation, the manual was organised according to the tools presented in Blackboard. Finally, concerning the imagery component, I used it in the form of snap shots taken from Blackboard in order to show participants how to perform a certain task step-by-step. The imagery component adheres to the concept of Paivio's dual coding theory (Clark & Paivio, 1991, as cited in Woolfolk, 2014). This theory states that information could be presented both visually and verbally- visually in the form of pictures and verbally in the form of words. In addition, pictures could be either static or dynamic and words could be either text or spoken.

Based on the above explanation, in this study, I am using both static pictures and printed on-screen text in order to present the content of the learning management system (Blackboard) through an online interactive manual uploaded on the university server. Through this manual, I

am focusing on knowledge construction so that participants can use it as a tool for helping them construct knowledge in order to construct meaningful learning.

In conclusion, it is important to highlight the tools that I used for creating the manual. The two software applications are Adobe Robohelp and Snagit. I used Adobe Robohelp in order to create the web manual in an organised format with a search option, hyperlinks, and menu. I added the search option so that participants can search for a keyword easily and eventually can access information faster. For the menu, I added it so that participants can find links to the manual content in front of them for ease of access and organisation. Finally, I added hyperlinks in certain pages in order to relate knowledge to previous ones. Finally, I used Snagit in order to capture pictures from Blackboard and I added them in the manual with illustrations and annotations. (Refer to appendix 6 for evidence)

Problem-based activities

The main reasons for using problem-based learning is twofold. First, it is used in order to increase learners' intrinsic motivation, collaboration, and autonomous learning. Second, it is used so that teachers can act as facilitators, not just knowledge transmitters. The latter can occur through scaffolding by providing students with resources or encouraging them to work with their colleagues.

In this study, my role was to act as a facilitator by provide participants with a tailored instructional manual as an online resource to guide them through the learning process, in addition to encouraging them to work with their peers to solve the problem-based activities. The problem-based activities were graded according to their level of difficulty.

Having highlighted the conceptual framework used in this study, the Chapter 3 focuses on the research methodology.

Chapter 3: Methodology

Research Questions

Based on the literature review included in Chapter 2, this research study attempts to answer the following research questions:

1- What are participants' perceptions regarding the tailored manual that was developed with reference to CTML?

2- What are participants' perceptions regarding the problem solving activities that were developed with reference to constructivist learning theory?

3- What are participants' perceptions regarding the designed training program?

- What skills did the participants acquire from the training?
- How did the training affect participants' perception of their learning after having the training?
- How did the training affect participants' affective aspect?
- To what extent teachers want to apply what they learned in real online classrooms?

4- To what extent were teachers able to apply what they learned in the workshops practically?

Research Context

Context is an important part in educational research, and if we want to understand the findings of a certain study, the context should be described in detail (Rosenberg & Koehler, 2015). According to Rosenberg and Koehler (2015), context is at the center of the TPACK framework, as is clearly stated by its developers (Mishra & Koehler, 2006). Since the design of

the professional development program in the current study is based on the TPACK framework, it is important to describe the context under scrutiny.

The study is conducted in the Arabic Language Instruction Department (ALI) in American University in Cairo. The department was established 80 years ago and it is fully accredited in both Egypt and the United States. The study took place in the department lab where updated computers, high-speed internet connection, projector, and white board are available. In addition, the lab is spacious and takes up to 20 students, although there were only six teachers included in the present study.

Researcher's Position

Epistemological Position

Since I am using constructivist learning theory in my study, constructivism is the most appropriate epistemological position for this research. The philosophy of this epistemology stems from Piaget, Vygotsky, and John Dewey (Woolfolk, 2014). It is important to highlight that there are many constructivist theories of learning, but they all agree on two central ideas. First, they agree that learners are continuously constructing their knowledge through active learning. Second, they agree that social interaction is of a pivotal importance in learning and in the building of knowledge.

In addition to the above, I adhere to the pragmatic point of view. My aim is to find practical solutions for real problems. Thus, in this study, I am training teachers, with a program designed using the TPACK framework in order to know to what extent it succeeded in achieving its aim, which is the positive effect of blending technology, pedagogy, and content together for enhancing learners' knowledge in a specific discipline using technology in a pedagogical way.

Work Position

The researcher has been working as the computer aided language-learning director in the target context since 2009. Accordingly, being an insider in the research context was considered an asset, in order to encourage teachers to participate in the study willingly, which would in turn lead to act naturally and authentically while the program was being conducted (Mercer, 2007).

Participants

There were six participants, all of whom were at one time a part-time Arabic language teacher in the Arabic Language Instruction Department (ALI). Only one of them was still working as a part-time teacher at the time of the study. Their ages ranged from thirty-six to forty-five years old. Two of them were males and four were females. All of them had taken courses in teaching Arabic as a foreign language in American University in Cairo. It is important to highlight the relationship between me, as a researcher, and them as participants. Although I work as a director of computer aided language learning in the department, I am not their director and I do not have any kind of authority in relation to them.

In order to recruit participants, I sent all part time and full time ALI teachers an email stating that there would be a workshop in summer to train ALI teachers on how to use Blackboard as a first step toward teaching Arabic online. Six teachers, from among forty who received the email, agreed to participate in the workshops, thus the sampling method was based on self-selection. The reason for the small sample is related to political issues since many foreign students were asked by their respective embassy to leave Egypt suddenly due to the unstable political situation that happened after the revolution. Therefore, most of the teachers who used to

teach in the summer session left the department, since there was no work, and the only ones who stayed for the workshop were the six participants.

Ethics

After receiving approval for the study from the Institutional Research Board of AUC, I had each of the six participants sign a consent form, which stated that their participation was voluntary and that they could withdraw from the study at any time. All participants signed the consent form as part of the research ethics stating that they agree to participate voluntarily in the research (Johnson & Christensen, 2008, p. 107). The consent form with the collected data were saved on my computer with a password. In addition, the transcribed data were printed on sheets of papers and were stored in my office at home, so no one has access to the data except me. A copy of the consent form is available in Appendix 1.

Research Design

Comparison between different research methodologies

In order to choose the most appropriate research methodology for this study, a comparison between them as described by Plomp (2007) is listed as shown in table below:

Table 4: Comparison between different research methodologies

Research methodology	Purpose
Case study	Describing, comparing or evaluating a specific phenomenon.
Experiments	Explaining theories or comparing the effectiveness of certain proposed interventions.
Action research	Designing and/or developing solutions to solve practical problems in specific contexts.

Correlational research	Describing or comparing relationships between certain variables.
Evaluation research	Defining the efficiency of a certain program.
Design-based research	Developing and designing interventions with both practitioners and technical experts in order to solve practical educational problems in a certain context through a number of iterations.

It is important to mention that I am aware of the overlap between action research and design-based research. However, I chose design-based research in this study because it is more often employed in research studies that use technology as a tool in designing interventions.

Design-based Research

The main aim of this study is to meet teachers' needs and eventually close the gap between theory and practice. Design based research was chosen as a research methodology for this purpose, as advocated by a number of researchers, like: Alghamdi and Li (2013); Anderson and Shattuck (2012); Herrington and Reeves (2011); Lai, Calandra, and Ma (2009); and Reeves, McKenney, and Herrington (2011).

Design based research has certain characteristics. For example, it goes through multiple phases and a number of iterations to make sure that the intervention is solving the educational problem (Amiel & Reeves, 2008). In addition, it is context-based, since context plays an important role in defining the problem (Anderson & Shattuck, 2012), and it is where both the practitioner and the technical expert work together in order to solve the problem (Alghamdi & Li, 2013). Theories are also used as reference points while designing the intervention (Reeves et al., 2011).

As Reeves (2006, as cited in Alghamdi & Li, 2013) stated that design-based research goes through four iterative phases as follows:

- Analysis of the practical problem
- Development of an intervention
- Evaluating and testing the intervention
- Documenting and reflecting on all phases to produce new design principles

The question that arises now is: "How design-based research is compatible with the current study?" To answer this question, the reasons are stated in table 5:

Table 5: Compatibility of the study with design-based research

Number	Reasons
1	The study aims to develop a professional development program for training participants on the use of a learning management system called Blackboard. This is a step for achieving a future target, which is teaching Arabic online.
2	The study is context based since it is conducted in a department in a certain university.
3	I am the researcher, the practitioner and the technical expert.
4	I used TPACK as a theoretical framework for designing the professional development program.

Finally, it is important to highlight that the majority of literature on design-based research tends to use a mixed methods data collection tools in order to increase both the validity and reliability of data gathered (Reeves et al., 2011; Van den Akker, Bannan, Kelly, Nieveen, & Plomp, 2013). As a result, in this study, I am using mixed methods for collecting data.

Data Collection Tools

Before going into details regarding the data collection tools, I want to highlight the difference between formative and summative assessment because they affected my decision regarding the choice of which tools to use in this study. Firstly, formative assessment is used during instruction and it helps teachers adjust their teaching for the benefit of their students (Woolfolk, 2014). Secondly, summative assessment is used at the end of the course in order to know students' level of accomplishment (Woolfolk, 2014).

In this study, I used both formative and summative assessment. Formative assessment was used in order to know participants' feedback regarding the manual throughout the workshop. Their suggestions were taken into consideration and changes were made in the manual accordingly. Summative assessment was also used in the performance exam in order to know to what extent participants were able to apply what they learned.

It is important to highlight the fact that tests are not absolute measures of learners' abilities (Woolfolk, 2014). As a result, in addition to the performance exam, I used two additional data collection tools, which are the semi-structured interviews and the closed-ended questions survey. The mixed data collection tools were used for increasing the validity and reliability of data (Cohen, Manion, & Morrison, 2007). The question that arises now is "Which tool did I use for answering which research question?"

Firstly, research question one, "What are teachers' perceptions regarding the tailored manual that was developed with reference to CTML?", was answered through a semi-structured interview. Secondly, research question two, "What are teachers' perceptions regarding the problem solving activities that was developed with reference to constructivist learning theory?",

was answered through semi-structured interview. Thirdly, research question three, "What are teachers' perceptions regarding the designed training program?", was answered through the semi-structured interview and the survey. Finally, research question four, "To what extent teachers were able to apply what they learned in the workshops practically?", was answered through a performance exam.

Semi-structured Interviews

The semi-structured interviews were conducted in English language and the questions were piloted with the first participant where they were found suitable. All interviews were recorded using my mobile telephone and they were all transcribed. Transcribed interviews were typed on a Word document and the total number of words was 11938 presented in 18 single spaced pages. I am highlighting the number of words in the word document like other peer-reviewed articles such as the one done by Shultz et al. (2015).

The semi-structured interviews included questions that target the following:

- The objectives from coming to the workshop.
- The reason behind their commitment for attending the workshop.
- Participants' perspectives of the problem-based activities.
- Participants' perspectives regarding the customised manual.
- The skills they acquired from attending the workshop.
- Their feelings while attending the workshop.
- Whether they want to apply what they learned for teaching online or not.
- The positive and negative aspects of the workshop.

Survey

The survey consisted of sixteen closed ended questions that aim to measure participant's attitudes towards the training. The questions were all around how they perceived the training from the following perspectives: duration, manual, feelings, problem-based activities, independence from the teacher, skills acquired, and collaboration. Fink (2013) indicated that these kinds of questions could be answered using Likert scale responses such as strongly agree, agree, neutral, disagree, and strongly disagree. (Refer to appendix 4 to view the survey questions.)

The trainer asked another researcher to read the questions in order to check the language of the questions to see whether they are readable and understandable or not. The response was positive and the questions were found easy to understand.

Performance Exam

Before getting into the details of the exam, I want to shed light on the view of CTML with respect to remembering and understanding (Mayer, 2009). Remembering means the ability of the learner to recognize the material presented to him/her and that could be assessed through a retention exam (Mayer, 2009). However, understanding means that the learner has the ability to use the material in new situations and that could be assessed through a transfer exam. Based on Mayer's (2009) definition of remembering and understanding, the performance exam used in this study took into consideration problem-based activities for evaluating learners' ability to retrieve previously learned information and to test their ability to transfer what they learned practically to new situations.

The performance exam was given to the participants in the computer lab. It was said that learners are capable of recalling information easily when they are placed in the same context (Ashcraft & Radvansky, 2010, as cited in Woolfolk, 2014). As a result, taking a test in a context that is similar to that of the learning context might lead to better performance.

The trainees were asked to answer the exam both in a written and practical format. I told them to write the answer step-by-step on the paper exam and to apply the solution on the computer. The exam consisted of ten problem-based activities. Each question was worth one point. In other words, I was interested in knowing whether they can solve the problem-based questions or not, so if their answers were accurate, I gave them one point. If the answer was partially correct, I gave them half a point and finally, if the answer was wrong, I gave them zero.

Validity of the instruments

In addition to the above, I review the three data collection tools in terms of their content validity, in order to make sure that they measure what they were intended to measure. In order to know that, the data collection tools should be supported by evidence to make sure that they are related to a particular use or purpose (Woolfolk, 2014). For example, the exam included problem-based questions similar to the ones they used to have in the workshop. In addition, the questions in both the semi-structured interviews and the closed-ended survey were related to the constructs included in the research questions. Therefore, it can be said that the three instruments have meet the requirements for content validity required of studies similar to the present one.

Procedures

Before getting into the scenario of conducting the workshop, I will first give a brief introduction of the first training session. I started the workshop by giving participants an overview of how Blackboard is an essential tool for teaching online. Then, I started breaking the ice between us in order to provide them with a friendly environment by talking to them in a friendly way and with a smile on my face. In addition, I told them that the target of this workshop is for them to make mistakes in order to learn. In addition, I told them that they would not be able to earn unless they make mistakes. Moreover, I asked them to introduce themselves and the reason behind coming to the workshop. I then asked them whether they used Blackboard before or not and they all indicated that it is the first time for them to use it. I asked them why they want to attend this workshop and they replied saying that they want to know how to reach more students online since the number of international students declined dramatically after the two revolutions.

In the first session also, I explained to them my role in the workshop. In other words, I told them that I am acting as a facilitator in order to guide them throughout the learning process and not to expect me to give lectures. Second, I asked them whether they used a manual before as a reference or not during their use of any software application. They told me that they never did that, so I told them that in this workshop, they will be using a manual that I created mainly for them in order to guide them through the use of Blackboard. In addition, I told them that I would update the manual based on their feedback and needs. After that, I gave them a sheet that included problem-based activities in the form of authentic problems they might face while using Blackboard. The problem-based activities were in the form of scenario they might face with students. The main aim is to make them focus on solving the problem rather than focusing on

what tool to use in Blackboard and how. I did want to make them focus from the beginning on the use of technology as a tool, not as an end in itself.

It is important to highlight that the session lasted for two and a half hours. However, I never pushed them to finish the entire problems in one session. In fact, I left them to work autonomously on their own pace without pushing them. In addition, when they asked me to help them in solving a certain problem, I first asked them whether they referred to the manual or asked their peers first or not. In case, they did not, I ask them to do so; else, I scaffold them for answering the problem by giving them hints so that they can depend on themselves. Below is a summary of the process that took place in the training:

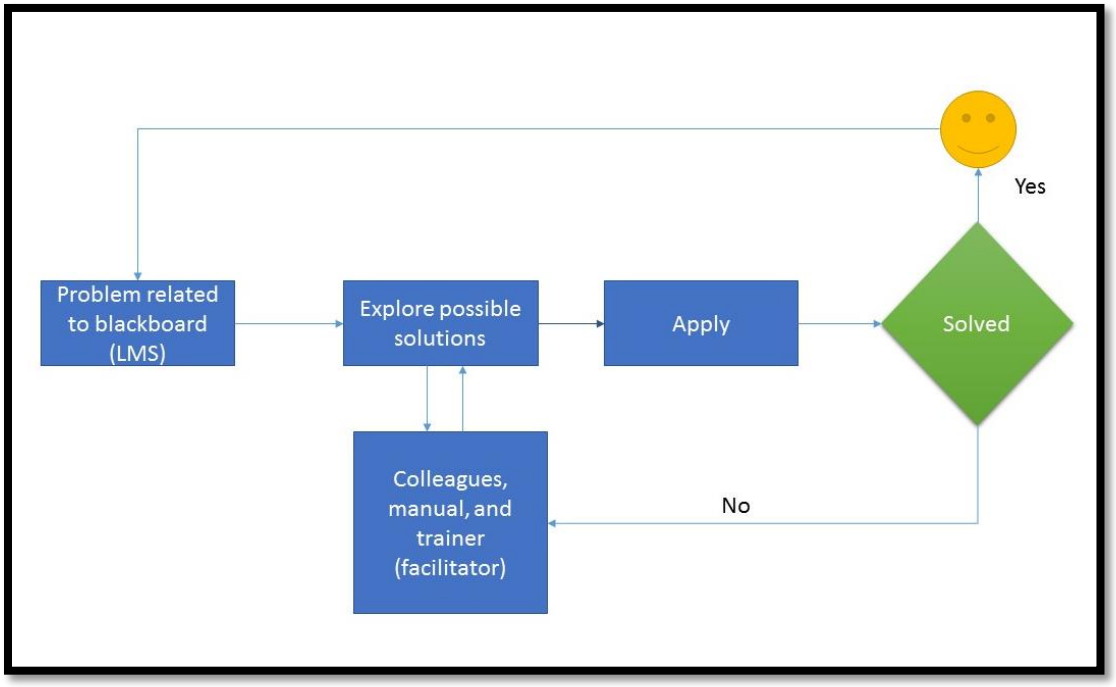

Figure 10: Training scenario

As indicated in the above diagram, the scenario went as follows:

- Participants were given the problem-based activities in a sheet of paper.

- They start exploring possible solutions through referring to the manual, colleagues, and finally myself.
- They start applying the solution.
- If the solution is correct, they go to the next problem-based activity.
- If the solution is wrong, they start the process again.

The workshop was conducted four times a week for seven weeks. Each session lasted for two hours and a half. Therefore, the training lasted for a total of seventy hours. At the end of the training, the performance exam was given to participants in order to assess their knowledge and their ability to retrieve and transfer information. In addition, the survey with the closed ended Likert scale questions was administered to them after finishing the performance exam in order to know their attitude towards the training.

Finally, the semi-structured interviews were conducted on the following day. All interviews were conducted in one day and each lasted from 30 to 50 minutes. All interviews were recorded using a mobile telephone and the data were transcribed within one week.

Data Analysis and Coding Technique

In this section, I will talk about the analysis of data gathered from the semi-structured interviews, closed ended question survey, and the exam.

Firstly, in the analysis of data gathered from the semi-structured interviews, I followed a number of steps adapted from Harding (2013, p.79). I used these steps after reading the transcripts three times to make sure that I took into consideration participants' responses clearly:

1- I focused on the parts that are most relevant to the objectives of the research and excluded the rest.
2- I eliminated the parts that I found redundant.
3- I highlighted the patterns and wrote summaries of the main points.
4- I coded the findings to match the objective of each research question and gave each a different colour for the ease of analysis.

In addition to that, the themes were identified and coded using a constant comparison technique (Glaser & Strauss, 1967, as cited in Charmaz, 2014). Before going through the details, I will first highlight the meaning of both "coding" and "constant comparison". First, "coding" according to Charmaz (2014), is a process used for understanding data. It is used to categorize segments of data by giving them short names. These names are used to summarise the information underlying them. These codes are then used for data analysis. Second, the constant comparison method is the process of comparing new data with old data (Charmaz, 2014).

Based on the above definitions, I used to move between data three times in order to make sure that I identified the most prominent themes from participants' responses. Moreover, I used three more procedures for data analysis- open coding, axial coding, and selective coding (Jones & McEwen, 2002, as cited in Pamuk, 2012). I used open coding for highlighting the main important parts of the data and axial coding in order to find relationships between coding. Finally, I used selective coding in order to finalize the entire coding procedure and select the ones that are most appropriate for answering the research questions.

Secondly, in the analysis of the survey responses, I created a table on an excel sheet following the structure of the survey given to the participants. In order to calculate the total number of responses in each cell, I put the digit "one" whenever the participant chose a certain answer. The process was repeated for each participant's response to each item. At the end, I calculated the total number of responses in each cell and got the total. After that, I created a graph showing participants' responses using excel as well.

Thirdly, concerning the exam, I used a rubric that I created myself stating whether the participant was able to answer the question totally, partially, or not at all. If the participant succeeded in answering the question successfully both written and practically, I give him/her a point. However, if the participant answered the question partially. In other words, s/he was not able to continue the question, or did not know how to answer it completely, I give him/her half a point. Finally, if the participant could not answer the question at all, I gave him/her a zero. At the end, I created a table with the total number of points gained by each student and created a graph using excel.

Finally, it is important to highlight here that the statistics I used here in both the survey and the exam is only descriptive. In other words, I did not target to use inferential statistics for three reasons. First, the sampling technique that I used was not random, but was based on self-selection. Second, the number of participants is only six and that is not enough for inferential statistics. Finally, I did not aim to generalise the findings.

Chapter 4: Results

In this section, the results are presented for each research question. Based on that, the main points in addition to some quotes that I found valuable are mentioned as well. Participants are referred to in the following form: R1, R2, R3, R4, R5, and R6.

Research Question 1

Research question one: "**What are participants' perceptions regarding the tailored manual that was developed with reference to CTML?**"

The results show that teachers' responses were all positive and they had constructive feedback regarding the use of the manual in their learning process. For example, they said that it was well organized, served their needs, useful, user friendly, made them feel confident, easy to use, fostered independent learning, and encouraging. The findings agree with those of Leow and Neo (2014), who wrote about the effectiveness of supplementary material for improving the quality of learning. Moreover, this results also agrees with the stance of Kanar and Bell (2013) who said that multimedia material with interactive effects for guiding learning enhance learners' autonomous learning.

For illustration and showing evidence regarding participants' responses, find below a number of quotes taken from the interviews:

- R5: "I don't have to worry about failing in one of the procedures, why? Because the manual is always there. I can open it in a new window and it is there, I can always go to the solution."

The above quote shows that the manual gave them more confidence while solving the problem-based activities. In addition, it also shows that they used it as a reference while working.

- R4: “the manual is a reference. I always feel like confident because I have something under my fingertips to take it out and to open it and to carry on the activity, it gives me a feeling that I have it in my bag.”

The above quotes also show that the manual reinforced their autonomous learning and encouraged them to use it without the presence of the trainer.

In addition, they showed their appreciation of the fact that I took their feedback towards the manual into consideration and edited it accordingly. For example, R2 said “I just want to thank my teacher because she makes us feel valuable and because she is respecting our minds and that she believes that, yes, we can do it.” Based on that, it is inferred that when the trainer considers their feedback, participants feel motivated and that might have lead them to feel attached towards the manual more.

Furthermore, R2 also said “She has this skill of listening well to others, which is very important. She also respects others' opinions whether she is with them or not. This is also one of the things that I've learned from the workshop.” This shows also that they appreciated the behaviour of the trainer towards them and that might have motivated them in the training itself.

Another participant said that the manual helped him/her in using Blackboard because s/he can refer to it whenever needed. For instance, R4 illustrated that in a metaphoric way by saying: “I find even a voice coming up and it takes my hand and tells me do this … I feel like I have a reference. The manual is a reference.” This illustrates their use of the manual as reference while designing the course on Blackboard.

R6 also said: “individuals have different special needs…therefore a lot of adaptions are needed if you want to be comfortable with it.” This quote is another evidence of their need to have a manual that can be modified in order to be more comfortable with. This advocates what Avalos (2011) stated concerning the importance of meeting teachers’ needs in the professional development programs.

Research Question 2

Research question two: “**What are participants’ perceptions regarding the problem solving activities that were developed with reference to constructivist learning theory?**”

Participants’ responses concerning the problem-based activities were all positive. For example, they said that: it is excellent, the best way to learn, interesting to try by hand, beneficial, increased their collaboration among each other, motivating and it provided them with hand-on experience. As a result, the findings are compatible with the findings of other researchers like Mondahl and Razmerita (2014); Hartfield (2010); and Etherington (2011).

R2 said: “I used to be able to concentrate for a lot more time and relate with the lecture because as I get older, my capability of concentration grows weaker. I love it when the task is specified. The trainer was also excellent at grading the tasks; grading easy things first, to familiarize with what we've done and gain self-confidence and then it would get more complicated. I liked this way of grading the tasks.”

The above quotes illustrate participants’ positive attitude towards the problem-based activities especially when they are graded in their level of difficulty. This confirms the findings of other research studies such as the one done by Mondahl and Razmerita (2014).

One of the participants also focused on the importance of having tasks divided into parts in order to feel motivated whenever each task is accomplished. This goes in line with the constructivist learning theory as stated by Woolfolk (2014). For more elaboration, find below two of the participants' quotes as follows:

- R2: "When the task is big, you don't know from where to start, but when it's broken into smaller parts and is graded that way, it becomes more doable and it helped me gain more self-confidence in learning more about this task."
- R3: "I prefer the way of the task-based because lecture makes me after a while…. they are stimulating attention more than the lecture."

Participants' responses also stressed the fact that problem-based activities made them feel engaged in the task itself. This is similar to the findings of a study conducted by Leow and Neo (2014).

Moreover, one of the participants described his/her feelings towards the problem-based activities in a metaphorical way. For illustration, consider the following quote:

- R6: "You have used very clever technique that you built on what we already know. You gave us a chance, a very wide window to speak about the theoretical bases of education our knowledge of education and then you start to give us the medicine pill by pill. A therapy until we liked that medicine. Yes, there is something missing for us and it is not a medicine – It is some sort of nutrition to survive – to catch the train that is moving very fast from a long time ago and we have to catch it now. The steps before the tasks. These steps that you gave us a chance to interpret on ourselves."

The above quotes show that they prefer the problem-based activity, which they considered as a new technique for them to use in learning something new. In addition, the graded

nature of the tasks was beneficial for them since that made them build on what they knew. Moreover, the quotes show their need for moving faster in their learning in order to keep updated with everything new emerging in the educational technology field. In addition, it shows also that the training encouraged them to reflect on their own thoughts and that made them know themselves more and eventually could help to change themselves for the better.

Research Question 3

Research question three: "**What are participants' perceptions regarding the training?**"

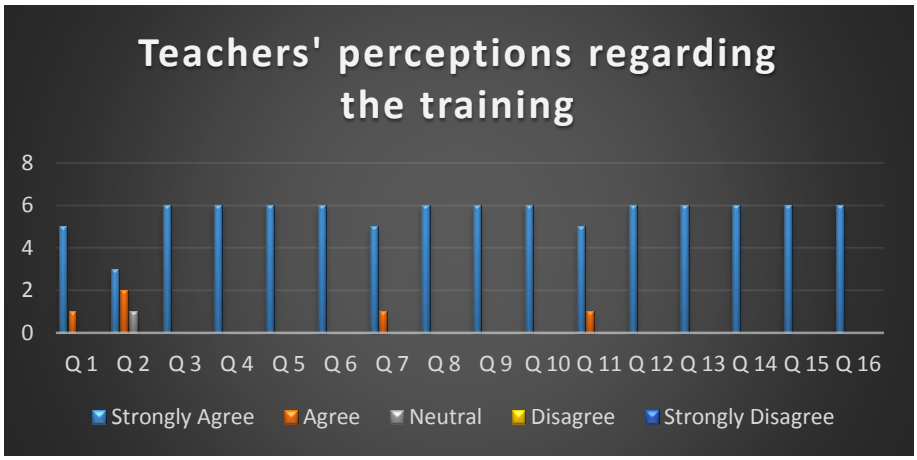

Figure 11: Survey results

As shown from the above graph, participants had positive attitudes towards the training in general since most of them chose "strongly agree" in response to most of the survey questions. However, the semi-structured interviews pinpointed a number of suggestions for enhancement such as assigning tasks for them to do at home; giving them an outline for the workshop from the beginning; and continue having workshops in order to proceed to more advanced phases.

In addition to the above suggestions, some of them reported the following:

- R5: “Actually, I still have to confess I still have negative feelings towards technology that might arise at anytime. I always feel, you will be threatened by a technology problem. Everything stopped. This is the negative things that I always have in my mind.”
- R2: “Maybe I was feeling that I am not homogeneous with someone that I am not happy with. Actually that happened. A trouble with that one, but that was because of changing mentality or because of something, but really I appreciated that was something negative.”

The above quotes show that some teachers still have negative attitudes towards technology due to some factors like the ones presented earlier in the literature review by Teo (2011), which were ease of use, facilitating conditions, and attitudes towards its use. In addition, the second quote shows that the participant was having a problem with one of his/her colleagues, but s/he was able to move forward and not to concentrate on it. As a result, this shows that the emotional aspect is another factor that affect teachers’ contribution in the training, as highlighted by Avalos (2011).

Results for sub question 1

- **What skills did participants acquire from the training?**

In the semi-structured interviews, teachers said that they acquired a number of skills such as technical skills, critical thinking skills, collaborative skills, concentration skills, interpersonal skills, and research skills. These responses reveal the need to focus on learners’ professional development skills in order to use technology effectively as stated by Sun (2011). In addition, the

findings are compatible with other research studies conducted by Tsai (2012) where positive results were found as learners' skills were enhanced. For evidence regarding teachers' acquisition of new skills, refer to these quotes:

- R2: "I am learning from my instructor and from my peers as well. I am even learning with the computer, which I am no more afraid of."
- R3: "Concentration skills, I'll have to concentrate in what I am following and to make things myself by hand - not receiving it from any other sources."
- R4: "Innovative ways to teach students."
- R5: "Critical thinking. The teacher always focuses on these skills specifically. All the presentation, we are listening to, she always starts with questions, and she does not give us the answer. She is welcoming all kinds of answers actually."

From the above quotes, we can find that participants acquired different skills that could be expected to affect their personal in addition to their professional life. Furthermore, they referred to points like observing the trainer in order to learn how to increase students' motivation in class. For illustration, refer to the following quote:

- R2: "To observe the teacher in front of me in order to learn how to improve myself as teacher and enhance my teaching process. Also, how to arise students' interests in the course and how to treat them respectfully, as adults."

Results for sub question 2

- How did the training affect participants' perception of their learning after having the training?

Participants indicated that the training affected their way of learning. For example, they said that it stimulated their way of thinking, shifted their perspectives, made them think that everything is doable, made them organize their thoughts, made them learn how to work in groups, made them perceive technology as a tool not as an end in itself, and taught them how to be patient in accomplishing tasks. These result indicate that the training affected their learning positively and made them think differently. For example, they said the following:

- R1: “It stimulates the way of thinking.”
- R2: “It is like a shift in our perspectives. How we view difficulties. You have to be patient enough and at the same time sure of success as long as you work well for it. You should try to think a lot and to ask people for help.”
- R3: “The technology is not the thing that will guide us. I will guide the technology to my objective.”
- R5: “Not to give up- I learned this because I knew technology is not that easy.”
- R6: “I think now I feel like a student, think out of the box, I can sit with myself and make mistakes – self learning and independent learning, so I feel now; I am just a part of the education process. I feel that it is adding me like a member of a community. I then have to be useful for others. I also have to find the most practical way to make my students reach my goals of teaching.”

From the above quotes, we can see that participants believe that they learned how to work in groups collaboratively and how to try different ways until they reach their objectives. Collaborative working is essential in the learning process as indicated by researchers like Hartfield (2010) because it motivates students to learn in a friendly environment and to be able to share and exchange knowledge. In addition, they learned to think innovatively in order to

accomplish tasks. Moreover, they learned that everything is doable as long as the person works hard.

Results for sub question 3

- How did the training affect teachers' affective side?

Participants stated that the training made them feel enthusiastic, motivated, confident, happy, engaged, committed, investing in their time and grateful to what they learned. The findings are positive and encouraging. In addition, they are different from those of Moore-Hayes (2011), who found that teachers' had low self-esteem after taking the training since there was no connection between what they took in the training and what they applied in real life. For illustration, find below a number of quotes:

- R2: "To be honest, I have not, for even once, had this feeling of fear again. It has disappeared."
- R3: "It was amazing I was impressed – I was very happy to know these new information and applying them."
- R4: "I felt that it passes so fast, two hours, but it passes too fast and we are always engaged and the point of being engaged is because we worked with our colleagues"
- R6: "I feel whatever you can master now; you can never stop learning, so I feel that I am a continuous student rather than a teacher or an instructor and I must think like a student and by the way that will help my teaching because I will feel how my students feel."

From the above quotes, it can be inferred that they had positive attitudes towards the training in general and the teacher and colleagues in particular. As a result, we might say that the atmosphere, teacher, colleagues, and their relationship are important for the learner and that they can act as a motivator or de-motivator in the students' learning process.

Results for sub question 4

- **To what extent teachers want to apply what they learned in real online classrooms?**

The six participants showed their willingness to teach Arabic online in the future. That is unlike the findings of Moore-Hayes (2011) which showed that teachers are still cautious towards integrating technology in teaching. For example, several participants' responses in this regard include the following:

- R2: "Definitely we are all eager to go through this experience, we are all eager to make it successfully, this is definitely a new move."
- R3: "Of course without these tools, I will not be able to. Now, I think that I have some tools help me to teach online and I am relieved – maybe this is obvious lesson plan and how to integrate it to Blackboard. I can put my plan in front of my students everything is clear in front of the student."
- R5: "Of course, I will. There is no doubt about this – there is no doubt."
- R6: "Yes, I am trying to do it and I am trying to find volunteer from student here."

All the quotes show how important online teaching is for the participants. In addition, their responses show that they now feel more comfortable towards using the different tools of Blackboard when teaching Arabic online in the future.

Research Question 4

Research question four: "**To what extent were teachers able to apply what they learned in the workshop practically?**" (Refer to appendix 5 for more details regarding the exam.)

The exam was given to the participants at the end of the training sessions. The aim of this exam was to assess their knowledge and see whether they can use the different features of Blackboard to design courses on it or not.

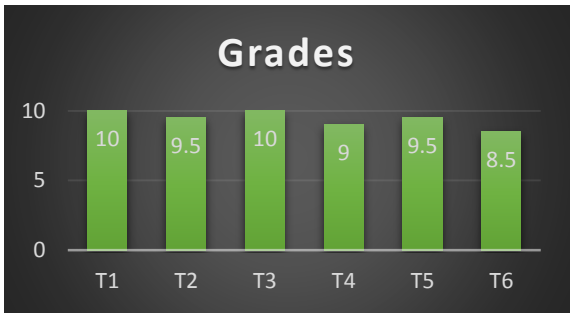

Figure 12: Exam results

As noted from the above figure, two of the teachers got the full mark and two got 9.5, one got 9 and another one got 8.5 out of 10. These results indicate that the teachers, in general, were able to apply the tasks given to them in the exam to a great extent.

Chapter 5: Discussion and Conclusions

In conclusion, teachers showed positive attitudes towards the training in general and the problem-based activities and the manual in specific. Their responses help to justify the use of the TPACK framework (Matherson et al., 2014). As previously stated in the literature review section, the TPACK consists of three main components, which are technology, pedagogy, and content. Koehler and Mishra (2006) and Kinchin (2012) focused on the importance of the use of the right pedagogy with the right technology to teach a certain content. In this study, the content that I want to train teachers to use is a learning management system. In order to train them, I used certain pedagogies that are related to the CTML and the constructivist learning theory.

In reference to the CTML, I created a manual to act as a reference during participants' learning process. This manual was designed in reference to the CTML as part of the pedagogical component of the TPACK framework. In addition, I used the problem-based activities in the form of authentic activities participants might face in reality while using the learning management system. This approach was used in reference to the constructivist learning theory, which I used as another part of the pedagogical component of the TPACK framework.

The problem-based activities were found useful because the problems were authentic, graded in their level of difficulty, and divided into parts. That motivated the teachers and made them more engaged with the tasks. Similar findings were noted in other studies that used problem-based activities in learning new concepts such as those done by Leow and Neo (2014) and Mondahl and Razmerita (2014).

For the manual, teachers perceived it positively because it served their needs and fostered their independent learning. This goes in line with other researchers such as Kanar and Bell (2013) who advocated the positive effect of multimedia material on learners' ability to learn independently.

In addition to the above, teachers acquired a number of skills from that training like collaborative skills and technical skills. This is related to what Tsai (2012) mentioned regarding the relationship between the positive results and the enhancement in learners' skills.

Finally, teachers felt motivated towards the training because there was a connection between what they learned in the workshop and what they really want to do in real life. This is different from the results of Moore-Hayes (2011) who reported teachers' low self-esteem after finishing the training as there was no connection between what they learned and what they really wanted to do. However, it is important to highlight that the participants of this study were self-selected and it is expected that they were motivated since they were not obliged to attend the workshop.

Theoretical Implications

It is important to highlight that TPACK succeeded in designing the training and achieving its target. However, more details could be added to this framework for guiding trainers especially those who do not know about the pedagogical teaching strategies. For more illustration, Mishra & Koehler (2006) did not add any details regarding the specifications of each component of the TPACK. For example, they stated only that the framework includes three components, which are technology, content, and pedagogy. However, they did not specify what kind of pedagogy to be used for each discipline.

Since TPACK is mainly used for training teachers on how to use technology, a number of learning theories could be recommended in the pedagogical component of the framework. Based on the results of this study, I propose that certain design principles to be added to the TPACK framework like constructivist learning theory and CTML.

Practical Implications

This study could help professional development designers who want to design professional development programs in contexts similar to the one under scrutiny. In addition, it can also help researchers who are interested in the TPACK framework to consider the two learning theories like constructivist learning theory and the CTML in order to use the TPACK effectively for integrating technology in their training. In addition, this study could pave the way for other researchers to think of other learning theories that could meet their needs with respect to certain disciplines while using the TPACK framework.

Limitations

Lee and Mayer (2015) previously stated that no study is perfect. Thus, the present study has a number of limitations as follows:

- The number of participants were six.
- I only reviewed peer-reviewed articles that are written in English not in Arabic. This limitation is a reflection of the reality that very few Arabic-language, peer-reviewed studies are readily accessible, for example, in online search engines. This issue is being addressed by academic organizations in the Arab countries and it is hoped that, in future, accessing this important source will be possible.

- The researcher who was conducting the training course also conducted the post training interviews with the participants.
- The researcher piloted the questions with the first person who was among the participants.

Recommendations for future research

In future research studies, researchers could take the approaches, methodology, and findings of this research into account when designing and implementing similar studies, but they need to take into consideration the limitations of this study. In addition, they might compare their findings with the findings of this study to see similarities, differences, and relationships. Moreover, I also recommend that future programs take this training more steps forward so that trainers can build upon for the sake of teaching Arabic online in the future.

In fact, training teachers who do not know how to use learning management systems and asking them to teach online, without adequate professional development, is not recommended because they will be asked to do something without having a strong background to refer to. As previously stated by Mishra and Koehler (2006), teachers should have a strong grounding in technology in order to use it in teaching. As a result, I recommend having more professional development programs built on this one since I consider it only a small step towards more training programs for enabling teachers to teach Arabic online.

List of References

Alghamdi, A. H., & Li, L. (2013). Adapting design-based research as a research methodology in educational settings. *International Journal of Education and Research, 1*(10), 1–12. Retrieved from http://www.ijern.com/journal/October-2013/27.pdf.

Amiel, T., & Reeves, T. C. (2008). Design-based research and educational technology: Rethinking technology and the research agenda. *Educational Technology & Society, 11*, 29–40. doi:10.1590/S0325-00752011000100012

Anderson, T., & Shattuck, J. (2012). Design-based research: A decade of progress in education research? *Educational Researcher*, *41*(1), 16–25. doi:10.3102/0013189X11428813

Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and Teacher Education*, *27*(1), 10–20. doi:10.1016/j.tate.2010.08.007

Ayres, P., & Paas, F. (2012). Cognitive load theory: New directions and challenges. *Applied Cognitive Psychology*, *26*, 827–832. doi:10.1002/acp.2882

Cavas, B., Canas, P., Karaoglan, B., & Kisla, T. (2009). A study on science teachers' attitudes towards information and communication technologies in education. *The Turkish Online Journal of Educational Technology*, *8*(2), 1303–6521.

Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). London: Sage.

Collins, L. J., & Liang, X. (2014). Task relevance in the design of online professional development for teachers of ELLs: A Q methodology study. *Turkish Online Journal of Distance Education*, *15*(3), 268–281.

Curran, E. M., Carlson, K., & Celotta, D. L. T. (2013). Changing attitudes and facilitating understanding in the undergraduate statistics classroom: A collaborative learning approach. *Journal of the Scholarship of Teaching and Learning*, *13*(2), 49–71. Retrieved from http://josotl.indiana.edu/article/view/3253

Domagk, S. (2010). Do pedagogical agents facilitate learner motivation and learning outcomes?: The role of the appeal of agent's appearance and voice. *Journal of Media Psychology*, *22*, 84–97. doi:10.1027/1864-1105/a000011

Duran, M., Brunvand, S., & Fossum, P. R. (2009). Preparing science teachers to teach with technology: Exploring a K-16 networked learning community approach. *The Turkish Online Journal of Educational Technology*, *8*(4), 21–42.

Dysart, S., & Weckerle, C. (2015). Professional development in higher education : A model for meaningful technology integration. *Journal of Information Technology Education: Innovations in Practice*, *14*, 255–265.

Etherington, M. B. (2011). Investigative primary science: A problem-based learning approach. *Australian Journal of Teacher Education*, *36*(9), 35–57. Retrieved from http://ro.ecu.edu.au/ajte/vol36/iss9/4/

Fink, A. (2013). *How to conduct surveys: A step-by-step guide* (5th ed.). Thousand Oaks, CA: Sage Publications.

Fook, C. Y., Sidhu, G. K., & AbdulAziz, N. (2011). Pre-Service Teachers' training in information communication and technology for the Esl classrooms in Malaysia. *The Turkish Online Journal of Distance …*, *3*(3), 97–108. Retrieved from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:PRE-SERVICE+TEACHERS+?+TRAINING+IN+INFORMATION+COMMUNICATION+AND+TECHNOLOGY+FOR+THE+ESL+CLASSROOMS+IN+MALAYSIA#0

Frechette, C., & Moreno, R. (2010). The roles of animated pedagogical agents' presence and nonverbal communication in multimedia learning environments. *Journal of Media Psychology*, *22*(2), 61–72. doi:10.1027/1864-1105/a000009

Gambari, A. I., Yaki, A. A., Gana, E. S., & Ughovwa, Q. E. (2014). Improving Secondary School Students ' Achievement and Retention in Biology Through Video-based Multimedia Instruction. *InSight: A Journal of Scholary Teaching*, *9*, 79–91.

Harding, J. (2013). *Qualitative data analysis from start to finish*. London: Sage Publications.

Ham, V. (2010). Participant-Directed evaluation: Using teachers' own inquiries to evaluate professional development in technology integration. *Journal of Digital Learning in Teacher Education*, *27*(1), 22–29.

Hartfield, P. J. (2010). Reinforcing constructivist teaching in advanced level biochemistry throuogh the introduction of case-based learning activities. *Journal of Learning Design*, *3*(3), 20–31. Retrieved from http://spydus8.nmit.vic.edu.au:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=55466305&site=ehost-live

Hermans, R., Tondeur, J., Braak, J. Van, & Valcke, M. (2008). The impact of primary school teachers ' educational beliefs on the classroom use of computers. *Computers & Education*, *51*, 1499–1509. doi:10.1016/j.compedu.2008.02.001

Herrington, J., & Reeves, T. C. (2011). Using design principles to improve pedagogical practice and promote student engagement. *Proceedings Ascilite*, 594–601. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84870769433&partnerID=40&md5=8175e94457e82b8e86cf7a73eb5c60e3

Hismanoglu, M. (2012). Prospective EFL teachers' perceptions of ICT integration: A study of distance higher education in Turkey. *Educational Technology and Society*, *15*(1), 185–196.

Hu, P. J., Clark, T. H. K., & Ma, W. W. (2003). Examining technology acceptance by school teachers : a longitudinal study. *Information & Management*, *41*, 227–241. doi:10.1016/S0378-7206(03)00050-8

Koehler M. & Mishra P. (2008). Introducing TPCK. In AACTE Committee on Innovation and Technology *Handbook of Technological Pedagogical Content Knowledge (TPCK) for educators*, pp. 3–29. New York: Routledge.

Kadijevich, D. M. (2012). TPCK framework: Assessing teachers' knowledge and designing courses for their professional development. *British Journal of Educational Technology, 43*(1), 28–30. doi:10.1111/j.1467-8535.2011.01246.x

Kanar, A. M., & Bell, B. S. (2013). Guiding learners through technology-based instruction: The effects of adaptive guidance design and individual differences on learning over time. *Journal of Educational Psychology, 105*(4), 1067–1081. doi:10.1037/a0033831

Kinchin, I. (2012). Avoiding technology-enhanced non-learning. *British Journal of Educational Technology, 43*(2), 43–48. doi:10.1111/j.1467-8535.2011.01264.x

Koc, M., & Bakir, N. (2010). A needs assessment survey to investigate pre-service teachers' knowledge, experiences and perceptions about preparation to using educational technologies. *The Turkish Online Journal of Educational Technology*, *9*(1), 13–22.

Kohen, Z., & Kramarski, B. (2012). Developing a TPCK-SRL assessment scheme for conceptually advancing technology in education. *Studies in Educational Evaluation*, *38*(1), 1–8. doi:10.1016/j.stueduc.2012.03.001

Kuruganti, U., Needham, T., & Zundel, P. (2012). Patterns and rates of learning in two problem-based learning courses using outcome based assessment and elaboration theory. *The Canadian Journal for the Scholarship of Teaching and Learning, 3*(1), 1–14. doi:10.5206/cjsotl-rcacea.2012.1.4

Lai, G., Calandra, B., & Ma, Y. (2009). Leveraging the potential of design-based research to improve reflective thinking in an educational assessment system. *International Journal of Technology in Teaching and Learning*, *5*(2), 119–137.

Lee, H., & Mayer, R. E. (2015). Visual Aids to learning in a second language: Adding redundant video to an audio Lecture. *Applied Cognitive Psychology, 29*(3), 445-454. doi:10.1002/acp.3123

Leow, F., & Neo, M. (2014). Interactive multimedia learning: Innovating classroom education in a Malaysian university. *TOJET: The Turkish Online Journal of Educational Technology*, *13*(2), 99–111.

Lin, H., & Dwyer, F. M. (2010). The effect of static and animated visualization: a perspective of instructional effectiveness and efficiency. *Educational Technology Research and Development, 58*(2), 155–174. doi:10.1007/s11423-009-9133-x

Ljubojevic, M., Vaskovic, V., Stankovic, S., & Vaskovic, J. (2014). Using supplementary video in multimedia instruction as a teaching tool to increase efficiency of learning and quality of experience. *International Review of Research in Open and Distance Learning*, *15*(3), 275–291.

Mayer, R. (2001). *Multimedia learning*. Cambridge: Cambridge University Press.

Mayer, R. (2009). *Multimedia learning* (2nd ed.). New York: Cambridge University Press.

Masood, M. (2010). An initial comparison of educational technology courses for training teachers at Malysian universities: A comparative study. *The Turkish Online Journal of Educational Technology*, *9*(1), 23–27.

Matherson, B. L. H., Wilson, E. K., & Wright, V. H. (2014). Need TPACK? Embrace sustainable professional development. *Teaching Performance*, 45–52.

Matzen, N. J., & Edmunds, J. A. (2007). Technology as a catalyst for change: The role of professional development. *Journal of Research on Technology in Education*, *39*(4), 417–430.

Mercer, J. (2007). The challenges of insider research in educational institutions: wielding a double-edged sword and resolving delicate dilemmas. *Oxford Review of Education*, *33*(1), 1–17. doi:10.1080/03054980601094651

Milovanovic, M., Obradovic, J., & Milajic, A. (2013). Application of interactive multimedia tools in teaching mathematics--examples of lessons from geometry. *Turkish Online Journal of Educational Technology - TOJET*, *12*(1), 19–31. Retrieved from https://ucd.idm.oclc.org/login?url=http://search.proquest.com/professional/docview/1413414422?accountid=14507\nhttp://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ1008863

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*. *39*(4), 417–430.

Mondahl, M., & Razmerita, L. (2014). Social media, collaboration and social learning - A case-study of foreign language learning. *Electronic Journal of E-Learning*, *12*(4), 339–352. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84904993600&partnerID=tZOtx3y1

Moore-Hayes, C. (2011). Technology integration preparedness and its influence on teacher-efficacy. *Canadian Journal of Learning and Technology*, *6*(108), 1017–1054.

Oster-Levinz, A., & Klieger, A. (2010). Online tasks as a tool to promote teachers' expertise within the technological pedagogical content knowledge (TPACK). *Procedia - Social and Behavioral Sciences*, *2*(2), 354–358. doi:10.1016/j.sbspro.2010.03.024

Paik, E. S., & Schraw, G. (2012). Learning with Animation and Illusions of Understanding. *Journal of Educational Psychology*, *105*(2), 278–289. doi:10.1037/a0030281

Pamuk, S. (2012). Understanding preservice teachers ' technology use through TPACK framework, *Journal of Computer Assisted Learning*, *28*(5), 425–439. doi:10.1111/j.1365-2729.2011.00447.x

Pool, J., Reitsma, G., & Mentz, E. (2013). An evaluation of technology teacher training in South Africa: shortcomings and recommendations. *International Journal of Technology and Design Education*, *23*(2), 455–472. doi:10.1007/s10798-011-9198-9

Rau, M. a, Aleven, V., & Rummel, N. (2014). Representations and Self-Explanation Prompts Successful Learning With Multiple Graphical Representations and Self-Explanation Prompts, *107*(1), 30–46. doi:10.1037/a0037211

Reeves, T. C., McKenney, S., & Herrington, J. (2011). Publishing and perishing: The critical importance of educational design research. *Australasian Journal of Educational Technology*, *27*(1), 55–65. doi:http://www.ascilite.org.au/ajet/ajet27/reeves.html

Rey, G. D., & Buchwald, F. (2011). The expertise reversal effect: cognitive load and motivational explanations. *Journal of Experimental Psychology. Applied*, *17*(1), 33–48. doi:10.1037/a0022243

Rosenberg, J. M., & Koehler, M. J. (2015). Context and technological pedagogical content knowledge (TPACK): A systematic review. *Journal of Research on Technology in Education*, *47*(3), 186–210. doi:10.1080/15391523.2015.1052663

Sang, G., Valcke, M., Braak, J. Van, & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education*, *54*(1), 103–112. doi:10.1016/j.compedu.2009.07.010

Schunk, D. (2008). *Learning theories: An educational perspective* (5th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Shultz, C. G., Chu, M. S., Yajima, A., Skye, E. P., Sano, K., Inoue, M., … Fetters, M. D. (2015). The cultural context of teaching and learning sexual health care examinations in Japan: a mixed methods case study assessing the use of standardized patient instructors among Japanese family physician trainees of the Shizuoka family medicine program. *Asia Pacific Family Medicine*, *14*(1), 8. doi:10.1186/s12930-015-0025-4

Sun, S. Y. H. (2011). Online language teaching: The pedagogical challenges. *Knowledge Management & E-Learning: An International Journal*, *3*(3), 428–447.

Sutton, S. R. (2011). The preservice technology training experiences of novice teachers. *Journal of Digital Learning in Teacher Education*, *28*(1), 39–47.

Teo, T. (2010). A path analysis of pre-service teachers' attitudes to computer use: Applying and extending the technology acceptance model in an educational context. *Interactive Learning Environments*, *18*(1), 65–79. doi:10.1080/10494820802231327

Teo, T. (2011). Factors influencing teachers ' intention to use technology: Model development and test. *Computers & Education*, *57*(4), 2432–2440. doi:10.1016/j.compedu.2011.06.008

Tsai, S.-C. (2012). Integration of multimedia courseware into ESP instruction for technological purposes in higher technical education. *Educational Technology & Society*, *15*(2), 50–61. Retrieved from http://www.ifets.info/journals/15_2/6.pdf

Uslu, O., & Bumen, N. T. (2012). Effects of the professional development program on Turkish teachers: Technology integration along with attitude towards ICT in education. *The Turkish Online Journal of Educational Technology*, *11*(3), 115–127.

van den Akker, J., Bannan, B., Kelly, A. E., Nieveen, N., & Plomp, T. (2013). *Educational Design Research*. Part A: An introduction. Enschede, The Netherlands: Netherlands Institute for Curriculum Development, p. 204.

Voogt, J., Fisser, P., Pareja Roblin, N., Tondeur, J., & van Braakt, J. (2013). Technological pedagogical content knowledge - a review of the literature. *Journal of Computer Assisted Learning*, *29*(2), 109–121. doi:10.1111/j.1365-2729.2012.00487.x

Wen, C. K. (2011). When creative problem polving strategy meets web-based cooperative learning environment in accounting education. *New Horizons in Education*, *59*(1), 106–118.

Woolfolk, A. (2014). *Educational psychology* (12th ed., Pearson New International ed.). London: Pearson Education Limited.

Yaman, Ş. (2010). Conceptual change of pre-service teachers: A longitudinal action research study in ELT. *Procedia - Social and Behavioral Sciences*, *3*, 227–236. doi:10.1016/j.sbspro.2010.07.037

Appendix 1: Ethics Form

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

Documentation of Informed Consent for Participation in Research Study

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Project Title: *Constructivist and Cognitive Multimedia Learning Theories as Tools for Training Teachers on How to Integrate Technology Using the TPACK Framework for Teaching Arabic Online*

Principal Investigator: *Rasha Essam,* erasha@aucegypt.edu*, mobile number: 010 000 85871*

You are being asked to participate in a research study. The purpose of the research is *to train you on how to integrate pedagogy with technology for teaching Arabic online*, and the findings may be *published, presented, or both*. The expected duration of your participation is *one year*.

The procedures of the research will be as follows: f*irst, you will receive training for about 4 months, and then you will be asked to finish an exam in order to know your level of knowledge after completing the training along with a survey to know your attitude towards the workshop. Moreover, an interview will be conducted to know your opinion regarding the training and the two learning theories used in this training. Finally, an impact survey will be given to you in order to know to what extent you got benefit from the workshop and its effect on your knowledge and career.*

There *will not be* certain risks or discomforts associated with this research.

There *will be* benefits to you from this research. *The expected benefits might be as follows: the ability to think pedagogically while using technology, the ability to teach Arabic online, and finally the ability to use online manuals for understanding different software applications.*

The information you provide for purposes of this research *is not confidential*.

Questions about the research, my rights, or research-related injuries should be directed to (Rasha Essam) at (010 000 85871).

Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or the loss of benefits to which you are otherwise entitled.

Signature _____

Printed Name _____

Date _____

Appendix 2: IRB Approval

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

To: Rasha Essam

Cc: Dena Riad & Salma Serry

From: Atta Gebril, Chair of the IRB

Date: Oct 2, 2014

Re: Approval of study

This is to inform you that I reviewed your revised research proposal entitled "**Constructivist and Cognitive Multimedia Learning Theories as Tools for Training Teachers on How to Integrate Technology Using the TPACK Framework for Teaching Arabic Online,**" and determined that it required consultation with the IRB under the "expedited" heading. As you are aware, the members of the IRB suggested certain revisions to the original proposal, but your new version addresses these concerns successfully. The revised proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants.

Please note that IRB approval does not automatically ensure approval by CAPMAS, an Egyptian government agency responsible for approving some types of off-campus research. CAPMAS issues are handled at AUC by the office of the University Counsellor, Dr. Amr Salama. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a year, you need to apply for an extension.

Thank you and good luck.

Atta Egebril

Dr. Atta Gebril
IRB chair, The American University in Cairo
2046 HUSS Building
T: 02-26151919
Email: agebril@aucegypt.edu

Appendix 3: Interview Questions

Interview Questions:

0- What were your objectives from coming to this workshop?

1- Why did you want to continue attending this workshop?

2- What do you think about the task based activities?

3- Did you use manuals before or this is the first manual to use?

4- What do you think about the manual created specifically for this workshop?

5- How did this manual affect your learning?

6- What skills did you acquire from this workshop?

7- Describe your feelings while attending this workshop?

8- How did this workshop affect your thinking style?

9- Do you think you will apply what you learned in real classrooms? How?

10- Do you think you will apply what you learned in virtual classrooms? How?

11- What are the most things that affected you positively in this workshop?

12- What are the most things that affected you negatively in this workshop?

13- What are the most things that you wish did not happen in this workshop?

14- What do you think of the workshop as an overall?

15- Do you have any suggestions for enhancing it?

Appendix 4: Sample of Problem-based Activities

Task 1:

I want to change the interface of my Learning Management System in order to be more appealing to my students.

Task 2:

I want to customize my course so that whenever my students access it, they go to a certain entry page.

Task 3:

My students always ask me for my contact details all the time such as: full name, email, work phone, office hours, office location, personal links or any other notes. What should I do to make it available all the time?

Task 4:

I always forget my students' emails and I want to add a link on my Learning Management System in order to send emails directly to all of them or one by one.

Task 5:

I want to add course syllabus so that students can refer to it anytime.

Task 6:

I created a link, but I want to hide it from my students for a certain time.

Task 7:

There are certain terminologies that I want my students to refer to throughout the course. Accordingly, I want to add a Glossary so that students can refer to it easily.

Task 8:

I want to have an organized course with a certain style to be viewed by my students. I want to categorize it by lessons, weeks, or skill as desired.

Appendix 5: Survey

Choose your preferred answer:

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Taking the training for 2.5 hours a day was convenient and useful.					
Meeting 4 times a week for 7 weeks made me practice more and know more features.					
Using the customized manual made me more self-confident.					
Using the video manuals showed me step by step how to solve a task.					
I learnt new technical skills after finishing this training.					
I became more self-confident using Blackboard.					
When I face a problem while creating my course on Blackboard, I don't panic.					
I learnt how to search for a piece of information on the customized manual.					
I prefer practicing more in the form of tasks and activities more than just listening to a lecture on how to solve a certain task.					
Now I can create my course on Blackboard from a pedagogical perspective.					
I knew that giving detailed instructions to students are very important in online learning.					
Working in groups facilitated my learning.					
Sometimes I ask my colleagues about how to solve a certain problem while working on Blackboard.					
I like working in group more than working alone.					

I am more encouraged to be trained on the next phases of online learning after taking this training course.					
I know more now about how to organize course content on Blackboard.					

Appendix 6: Performance Exam

Exam

Create the following on Blackboard:

Task 1:

Create a content area called "Exam Tasks". Inside this content area, create the following:

A Folder called: Day 1
A Folder called: Day 2
A Folder called: Day 3

Task 2:

In Day 1, create a learning module for teaching a certain topic. This learning module should include the following:

- A guided instructions of what should be done on that day
- A picture about a very famous political person.
- An article that talks about this person.
- List of target vocabulary using Flash.
- Create a Wiki so that each group can edit in the Wiki content. The target of this Wiki is to ask students to search for a similar political person in their country and write about.
- Assignment targeting the explained vocabulary.

Task 3:

In Day 2, create the following:

- A guided instructions of what should be done on that day
- Web link that enables students to collect more information regarding a certain topic.
- Blog that can be seen by each student individually. In other words, the blog of each student can't be seen by other students in class. Ask students through this Blog to write about any topic of your choice.

Task 4:

In Day 3, create a Lesson Plan that includes the following:

- Module Page that includes Alerts and Announcements only.
- Blank Page and write in it some instructions regarding what they expect to do in that day.
- An attached file to an item with all the exercises that you want your students to solve.

Task 5: What do you think of this organization and why?

Task 6: One of your colleagues is asking you how can s/he do the following. Please explain step by step how these tasks can be done.

Task 7: As a teacher, I see many columns in front of me and that confuses me all the time, so I want columns that show each assignment separately to be hidden. Only the Total assignment column I want to see it in front of me in the Grade Centre.

Task 8: I want to hide certain columns from the students because I didn't finish grading all students.

Task 9: I want to create a new column called "Bonus" which is equal 10 points.

Task 10:

I want to create a column that shows the weighted total. The Weighted Total should be as follows:

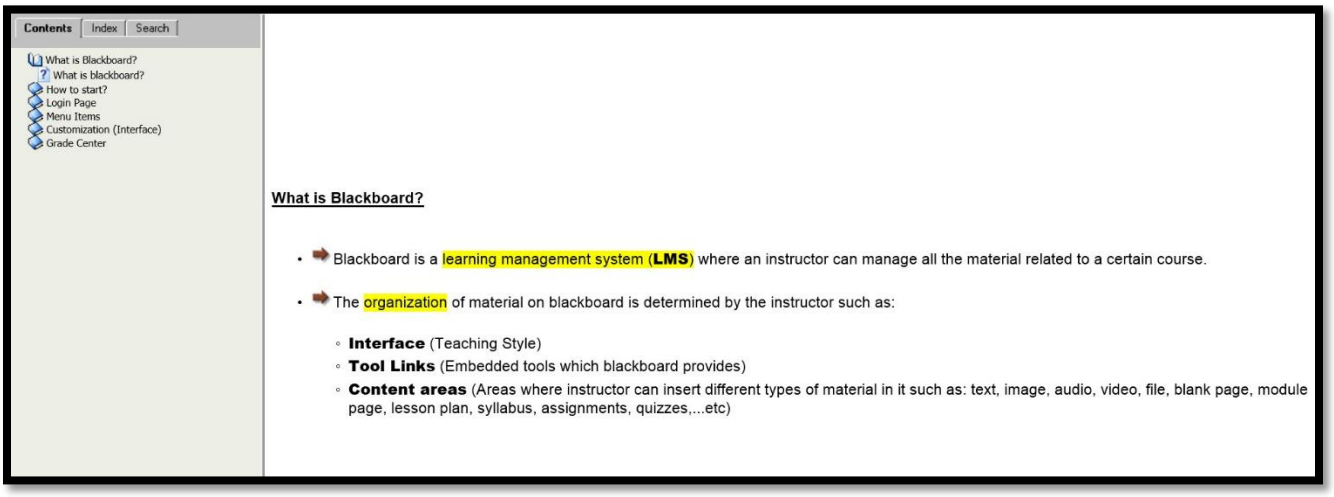
- Assignment = 20 %
- Wikis = 10 %
- Blogs = 10 %
- Participation = 15 %
- Mid Term = 20 %
- Final Term = 25 %

As a teacher, you want to create a grading schema called “ALI Schema”.

As a teacher, you want to view a report of certain students in order to view all his/her grades.

Appendix 7: The Manual

The manual was presented in the following sequence as follows:



The content of the pages are as follows:

1- **What is Blackboard?**

- Blackboard is a learning management system (**LMS**) where an instructor can manage all the material related to a certain course.
- The organization of material on blackboard is determined by the instructor such as:
    - **Interface** (Teaching Style)
    - **Tool Links** (Embedded tools which blackboard provides)
    - **Content areas** (Areas where instructor can insert different types of material in it such as: text, image, audio, video, file, blank page, module page, lesson plan, syllabus, assignments, quizzes,...etc)

2- How to start?

- **First**: You have to think of an organization of the course you teach in a way that enables students access a certain information easily.

How?

- **Second**: Think of a certain menu organization such as by: Topics, Lessons, Weeks,.... etc

How?

- **Third**: Start creating the menu items as follows:

- **Fourth**: Click on the plus sign as shown above in order to start creating the needed links as follows:

- **Fifth**: There are six types of menu items as follows:

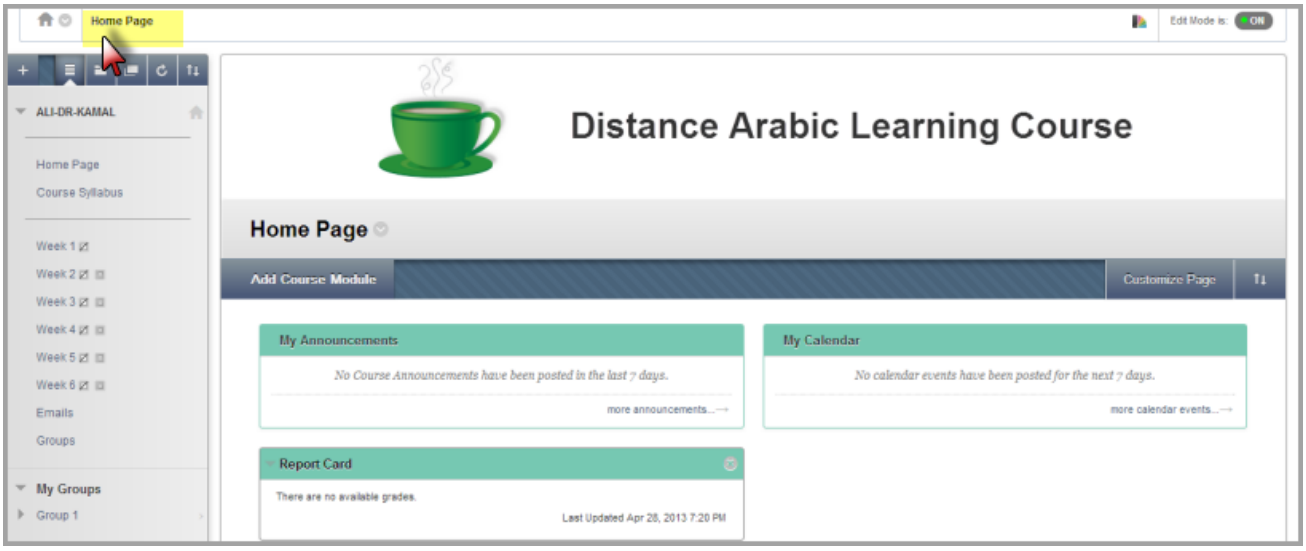
Content Area: An area where you can add any type of material in it such as: audio, video, text, file, folder, assignments,.... etc
Module Page: A page where you can enable adding certain items to be added on it such as: announcements, tasks, to do list, course media, report cards and alerts.
Blank Page: As its name explains. It is a blank page where you insert in it anything you want for your students about the course.
Tool Link: Blackboard provides certain tools for facilitating course management such as: grades, announcements, blogs, calendar, contact details, course messages, discussion board, journals, Glossary, Groups, Wikis,...etc. Through Tool Links, you can create shortcuts to the tools provided by blackboard.
Web Link: You can create a web link to be accessed easily by your students.
Course Link: You can create a link to a certain page inside the course itself.

3- To log into Blackboard, follow these steps:

- Type this web address in any browser: **http://blackboard.aucegypt.edu**

- Insert **username used in your AUC email** in the first text field. (**Don't put @aucegypt.edu**)
- Insert your **Auc email password** in the second text field.
- Press "**Login**" in order to login with your account.

- All courses that you teach appear in the above box.
- Click on the course name and the page appears as follows:



4- How to create a course content area:

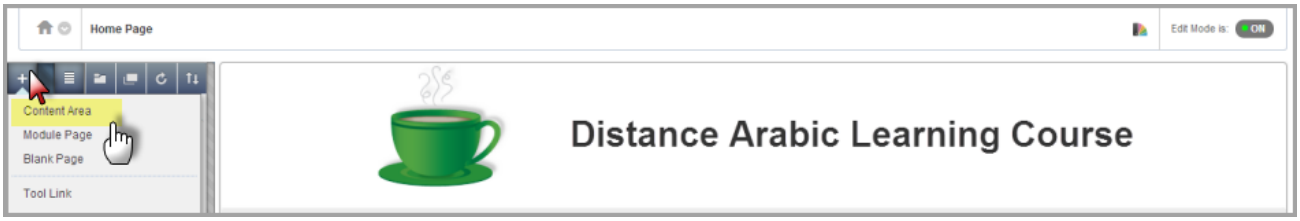
Remember:

Course content area is an area where you can add all material to it such as: text, audio, video, image, files, assignments, folders, lesson plan, syllabus,...etc.

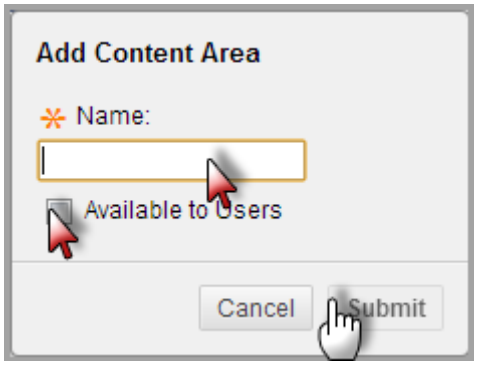
To create a course content area, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Login Page
- First: Click on the plus sign and a menu appears as shown below:

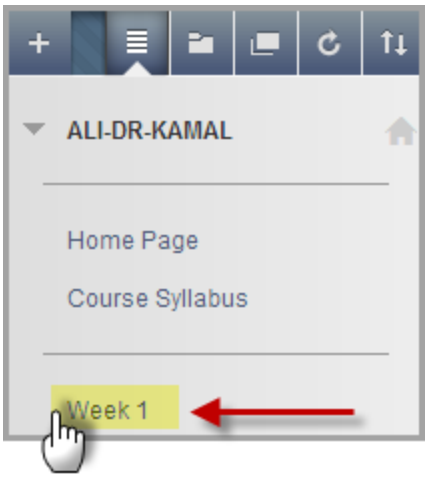


- Second: Click on "**Content Area**" and another window will appear as follows:

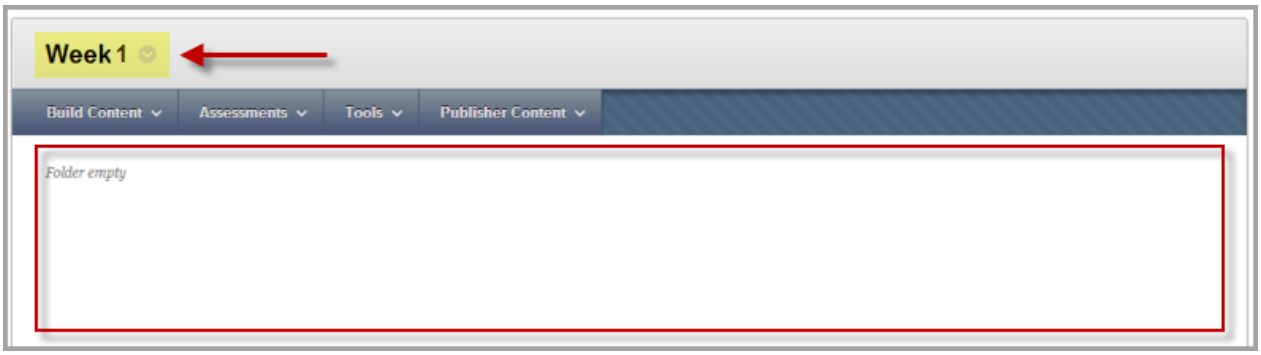


- Insert the desired **Content area** name in the above text field.
- Click on the above check box in order to make the content area **available to users**.
- Press "**Submit**" in order to save the process.

- The new content area appears as follows:



- Click on the new content area "**Week 1**" in order to add all the desired course content as follows:



5- How to add an item:

Remember:

Item is very general where an instructor can add file, text, image, video, audio, or link. Since an item is very general, therefore it doesn't provide certain specifications for images, audios, or videos.

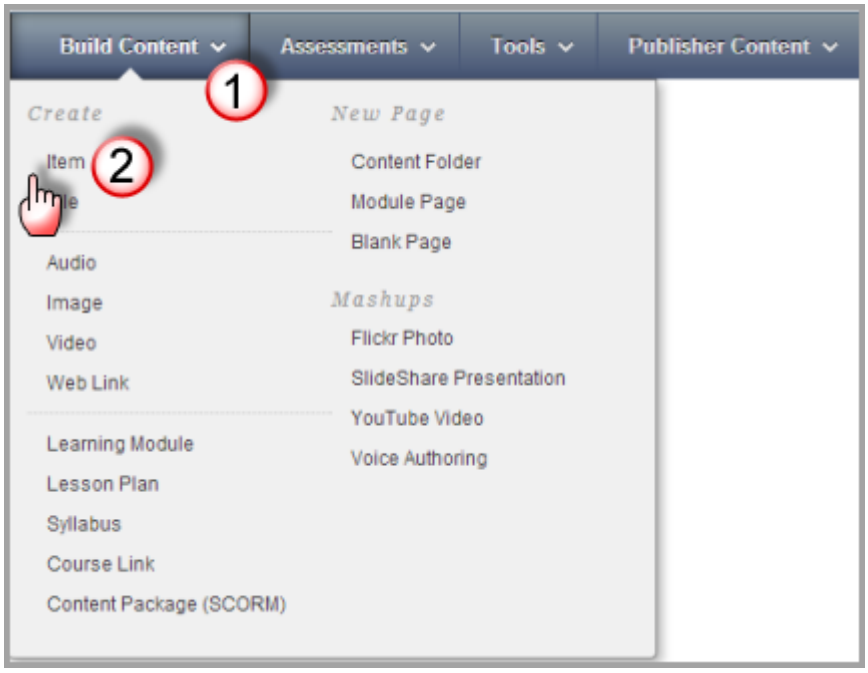
Note:

Do not forget to put instructions to students in order to know what to do with this material.

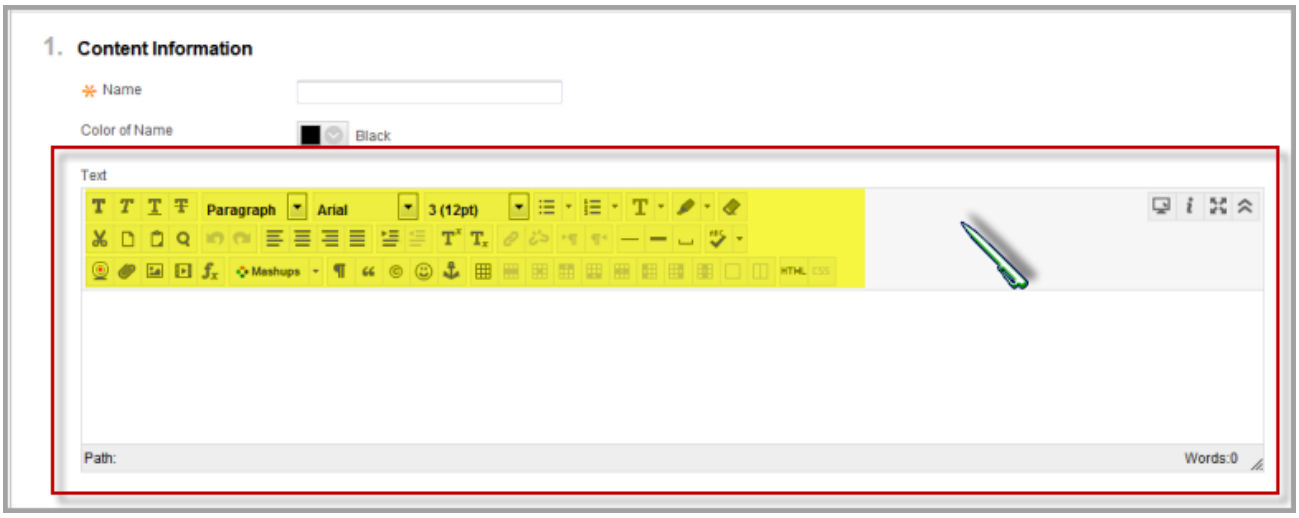
To add an item, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- **Reminder:** Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Item**"

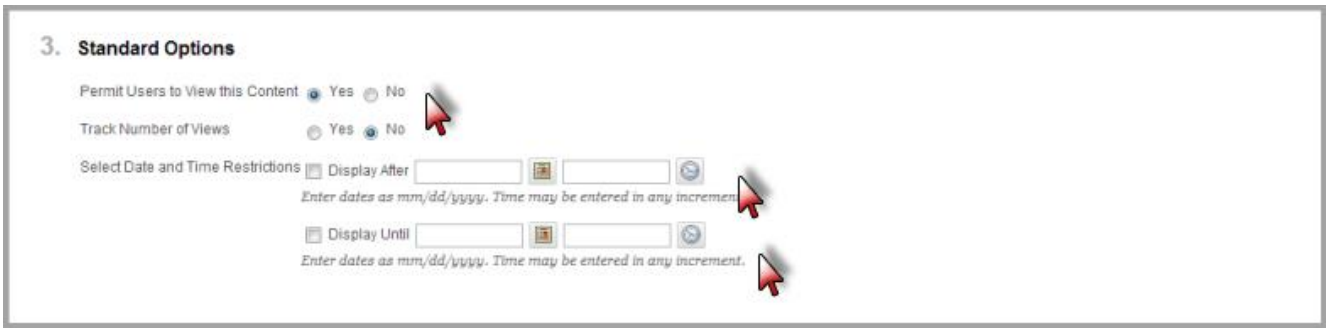


- A page appears as follows:



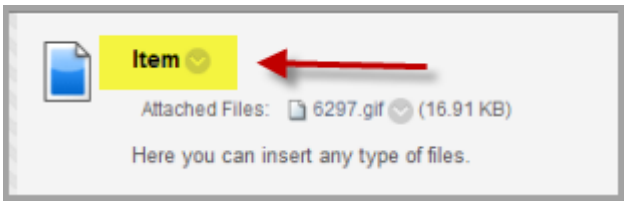
- Insert item name in the "**Name**" text field.
- Select color of the file name as desired.
- insert any of the following in the above text box: text, file, symbols, image, flash, video, hyper link, table, ... etc.

- Select any file (s) to attach from your drive by pressing "**Browse My Computer**" button.
- Select any file (s) to attach from your blackboard content by pressing "**Browse Content Collection**" button.



- Click on the radio button next to "**Permit Users to view content**" in order to enable students' to view the item.
- Click on the radio button next to "**Track Number of Views**" in order to monitor students' access to the item.
- Select date/time of file display from "**Display After**" and "**Display Until**". (**Optional**)

- Press "**Submit**" in order to save the process and the new item appears as follows:



6- How to add flash file:

Remember:

Instructor can add flash to be seen by students through this page. Any PowerPoint presentation can be converted to flash so that students can't edit in the content.

Note:

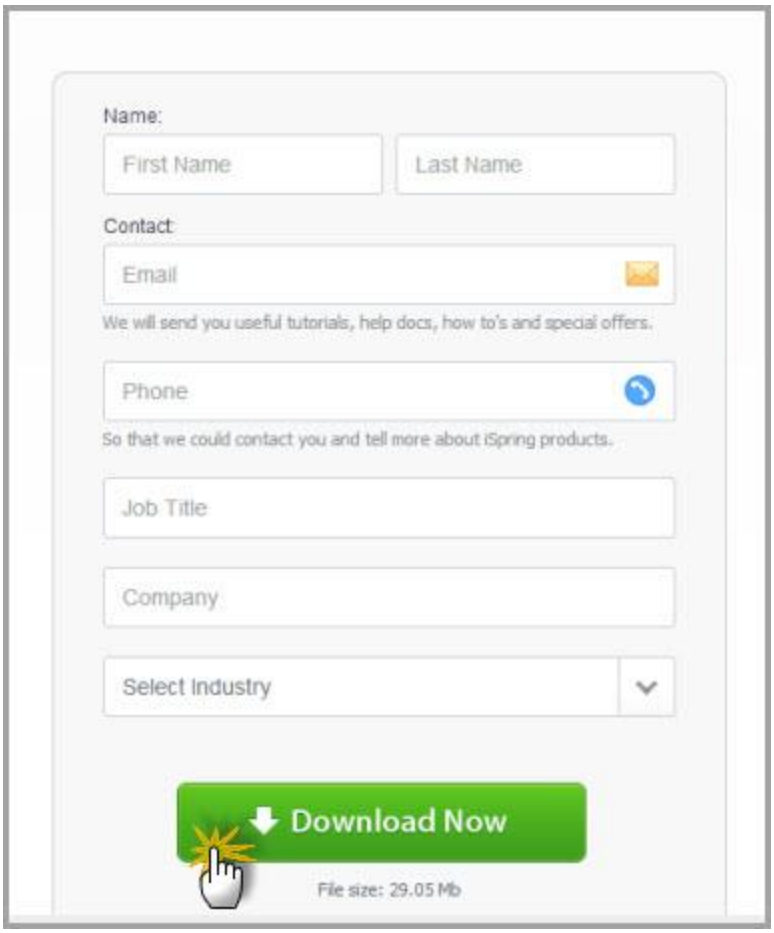
Do not forget to put instructions to students in order to know what to do with this material.

To add a Flash, follow these steps:

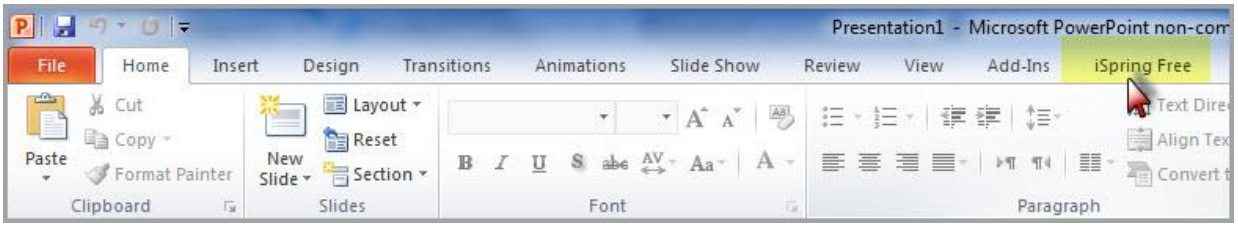
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

First Step

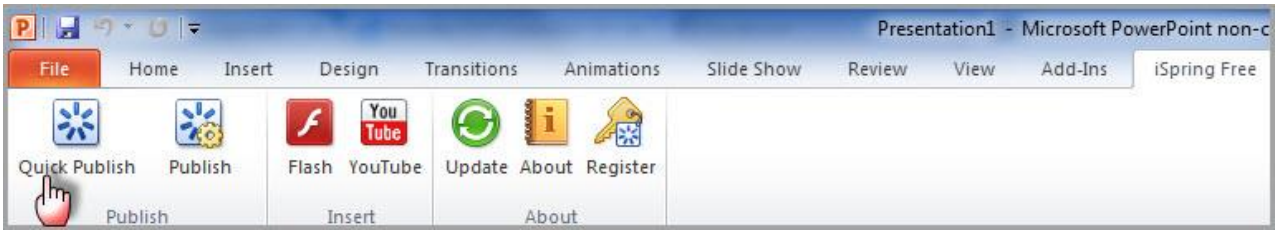
- Go to Google and type this: **Download Ispring Free**
- Click on the desired Web page and a page will appear as follows:



- Press "**Download Now**" in order to start downloading the program.
- After the setup of **ISpring** completes, open "**PowerPoint**" and an icon appears as follows:



- Create your **PowerPoint** presentation, then click on the **above icon**.

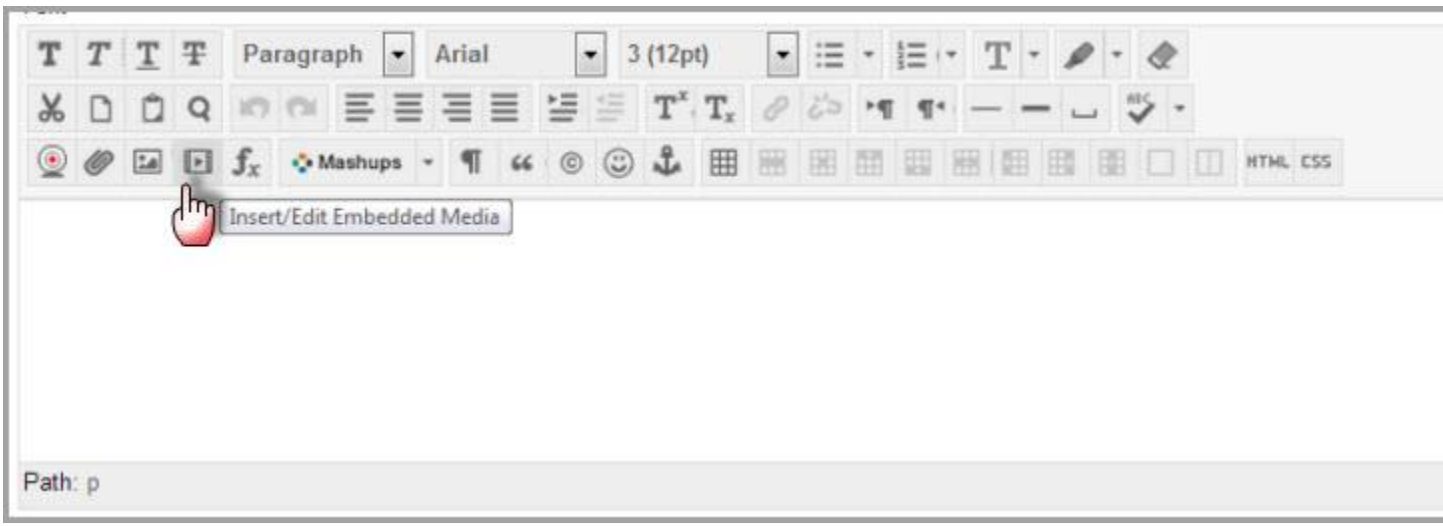


- Click on "**Quick Publish**" in order to start converting PowerPoint to Flash.
- Three files will appear as follows:

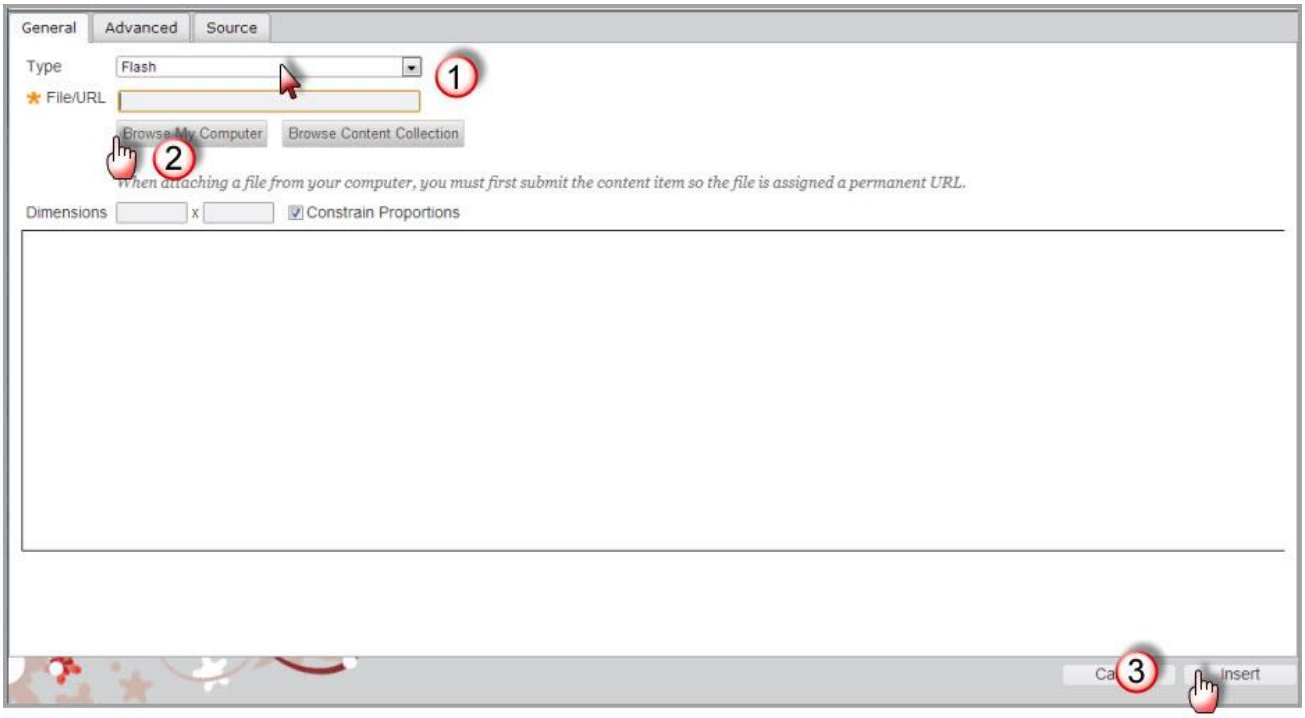
- Take the file with the type: **SWF Movie** and save it in the desired location.

Second Step

- Create an item (How to create an item)
- A text editor appears as follows:



- Click on the above icon and another window appears as follows:



- Select "**Flash**" from the drop down menu.
- Press "**Browse My Computer**" in order to select desired flash file, which you already created.
- Press "**Insert**" in order to insert the Flash.
- Press "**Submit**" in order to save the process.

7- How to add a file:

Remember:

Instructor can upload file of any type. These files appear to students and can download them on their own computers.

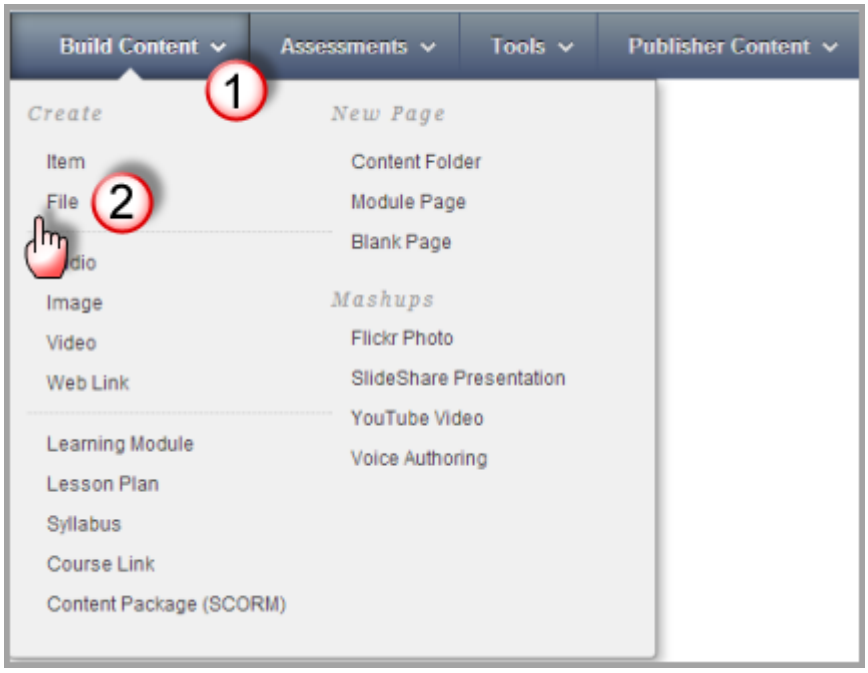
Note:

Do not forget to put instructions to students in order to know what to do with this material.

To add a file, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

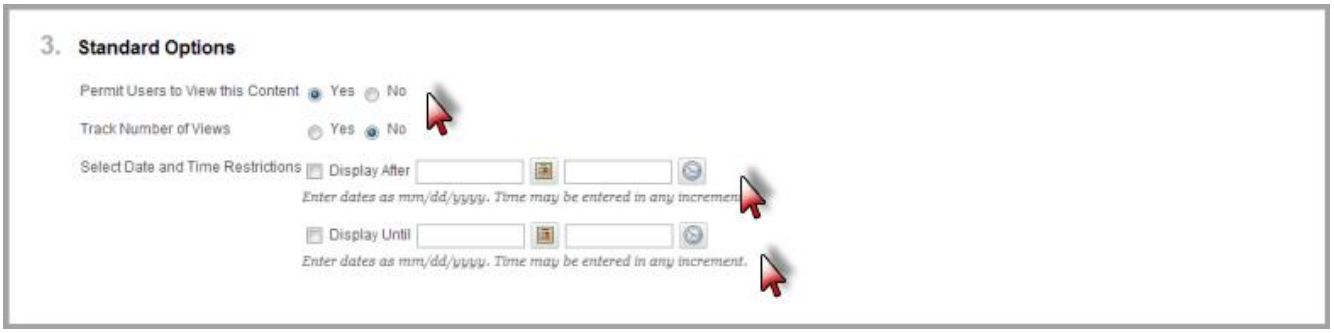
- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**File**"



- A page appears as follows:

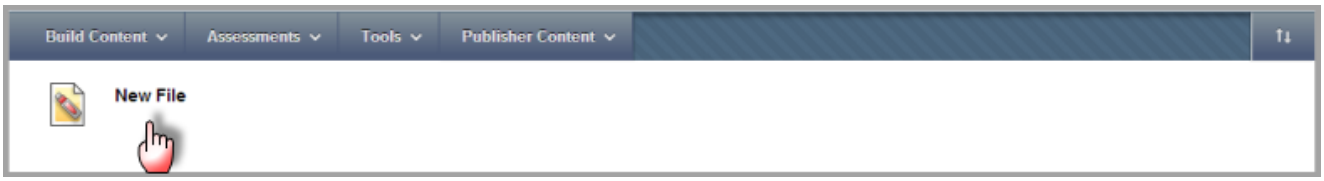
- Insert file name in the "**Name**" text field.
- Select color of the file name as desired.
- Press "**Browse My Computer**" in order to select the desired file.

- Select file option whether to open a file in a new window or not from the above radio buttons.



- Click on the radio button next to "**Permit Users to view content**" in order to enable students' to view the file.
- Click on the radio button next to "**Track Number of Views**" in order to monitor students' access to the file.
- Select date/time of file display from "**Display After**" and "**Display Until**". (**Optional**)

- Press "**Submit**" in order to save the process and the new file appears as follows:



8- How to add video:

Remember:

Instructor can add video to be seen and played by students through this page. Students can also download these videos on their own computers.

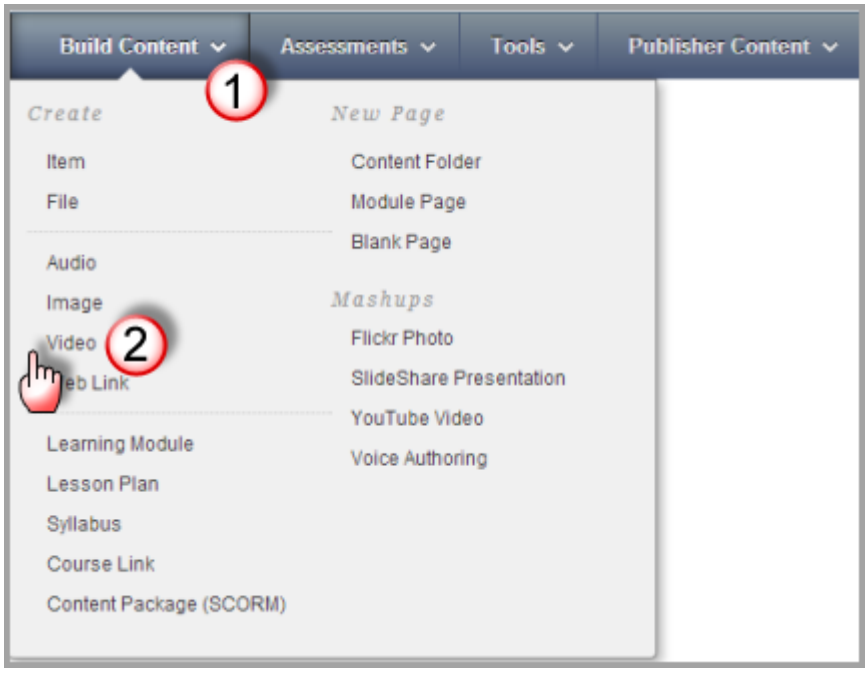
Note:

Do not forget to put instructions to students in order to know what to do with this material.

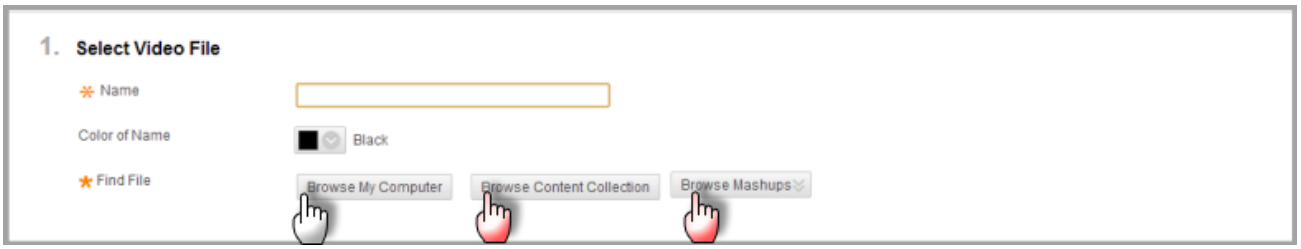
To add a video, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Video**"

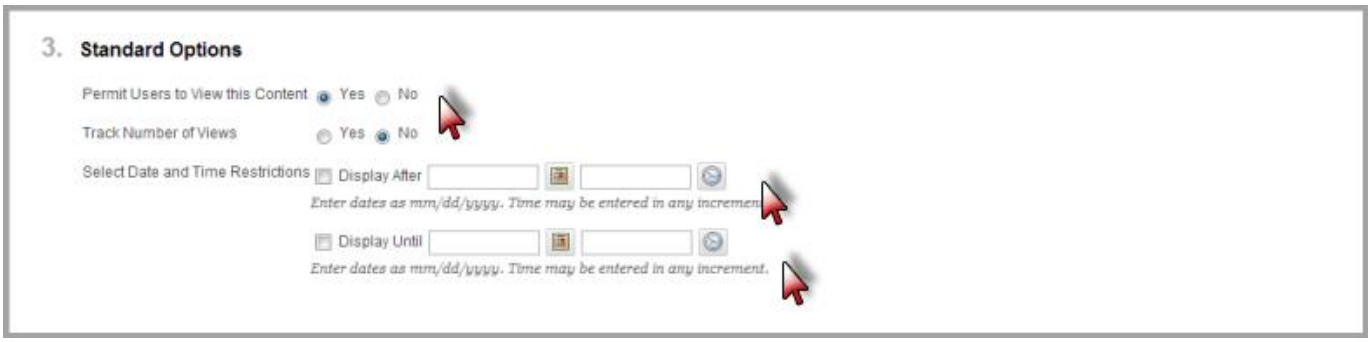


- A page appears as follows:



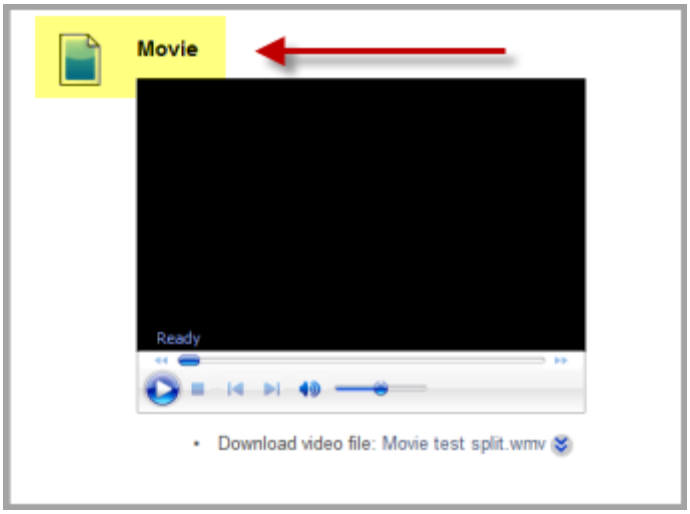
5. Insert video name in the "**Name**" text field.
6. Select color of the file name as desired.
7. Press "**Browse My Computer**" in order to select the desired file.
8. Press "**Browse Content Collection**" in order to select an already inserted video from your content.
9. Press "**Browse Mashups**" in order to add a Youtube video.

- Select video options such as dimensions, auto start, loop, etc. from the above drop down menus.



- Click on the radio button next to "**Permit Users to view content**" in order to enable students' to view the video.
- Click on the radio button next to "**Track Number of Views**" in order to monitor students' access to the video.
- Select date/time of file display from "**Display After**" and "**Display Until**". (**Optional**)

- Press "**Submit**" in order to save the process and the video appears as follows:



9- How to add images:

Remember:

Instructor can add image to be seen by students through this page. Students **can** download these images by **Save As**

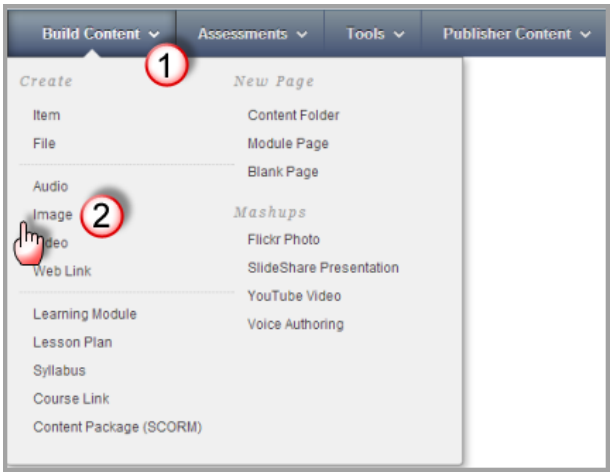
Note:

Do not forget to put instructions to students in order to know what to do with this material.

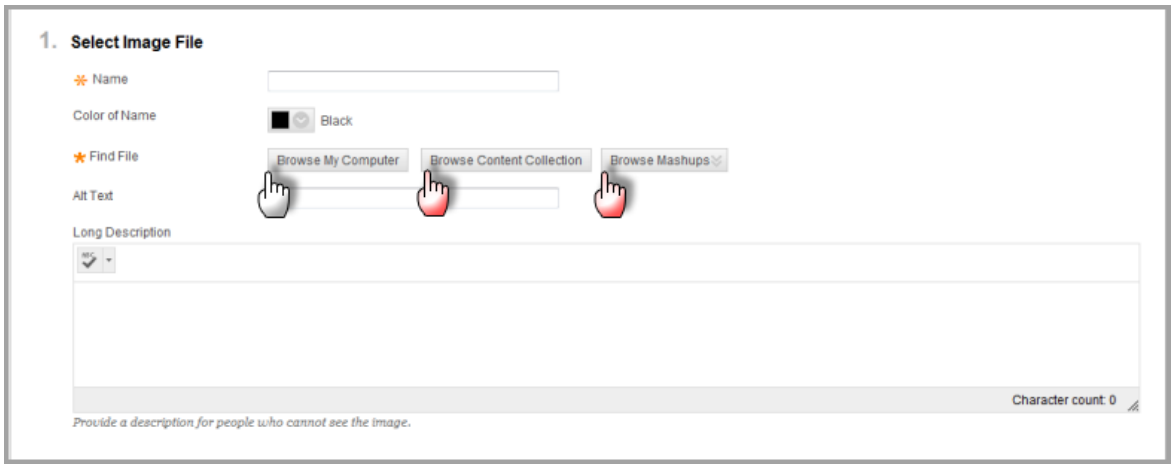
To add an image, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Image**"

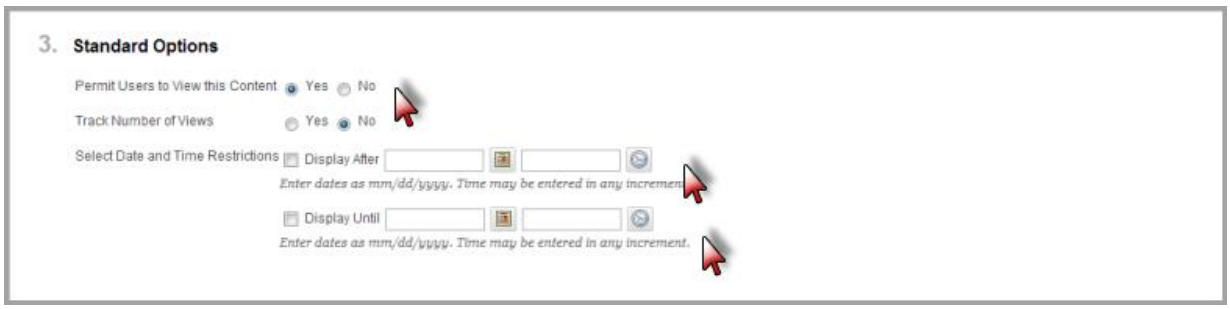


- A page appears as follows:



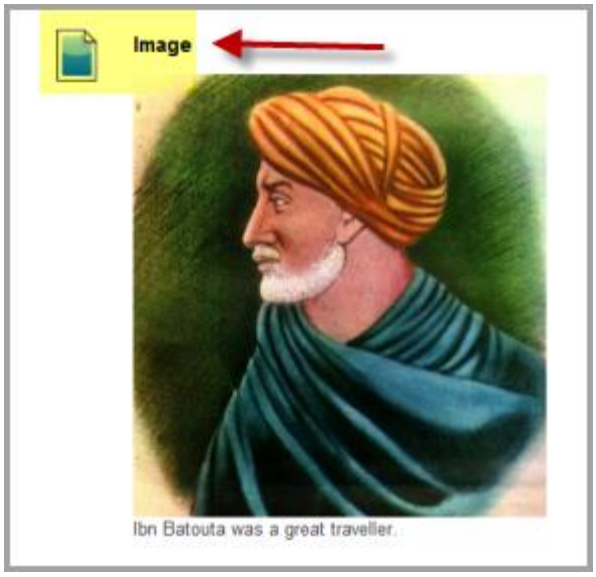
- Insert image name in the "**Name**" text field.
- Select color of the image name as desired.
- Insert alternative text and image description in the above text fields. (**Optional**)
- Press "**Browse My Computer**" in order to select the desired file.
- Press "**Browse Content Collection**" in order to select an already inserted image from your content.
- Press "**Browse Mashups**" in order to add a Flickr photo.

- Select image options such as dimensions, border, target url, etc from the radio buttons.
- Click on the radio button next to "**Custom**" in order to change the width and height.
- Select the thickness of the border by selecting a number from the drop down menu.
- Insert a hyper link whenever you click on the image by inserting the address in "**Image Target URL**" text field.



- Click on the radio button next to "**Permit Users to view content**" in order to enable students' to view the image.
- Click on the radio button next to "**Track Number of Views**" in order to monitor students' access to the image.
- Select date/time of file display from "**Display After**" and "**Display Until**". (**Optional**)

- Press "**Submit**" in order to save the process and the image appears as follows:



10-How to add audio:

Remember:

Instructor can add audio to be seen and played by students through this page. Students can also download these audio files on their own computers.

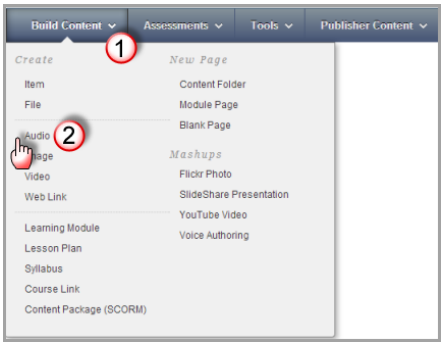
Note:

Do not forget to put instructions to students in order to know what to do with this material.

To add an audio file, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

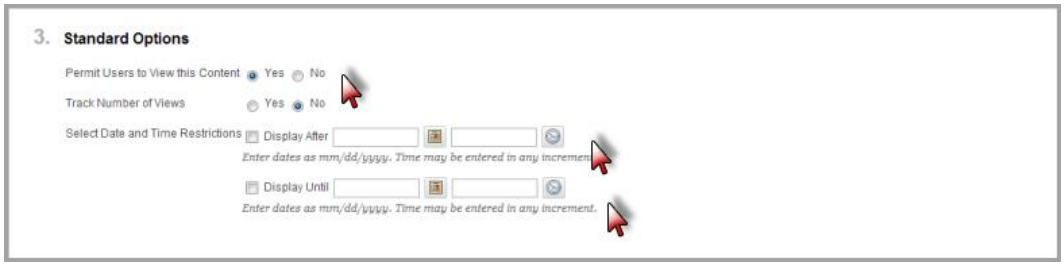
- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Audio**"



- A page appears as follows:

5. Insert audio name in the "**Name**" text field.
6. Select color of the file name as desired.
7. Press "**Browse My Computer**" in order to select the desired file.
8. Press "**Browse Content Collection**" in order to select an already inserted video from your content.

- Select audio options such as auto start, loop, and add transcript etc. from the above radio buttons.



- Click on the radio button next to "**Permit Users to view content**" in order to enable students' to view the video.
- Click on the radio button next to "**Track Number of Views**" in order to monitor students' access to the video.
- Select date/time of file display from "**Display After**" and "**Display Until**". (**Optional**)

- Press "**Submit**" in order to save the process and the video appears as follows:

11-How to add lesson plan:

Remember:

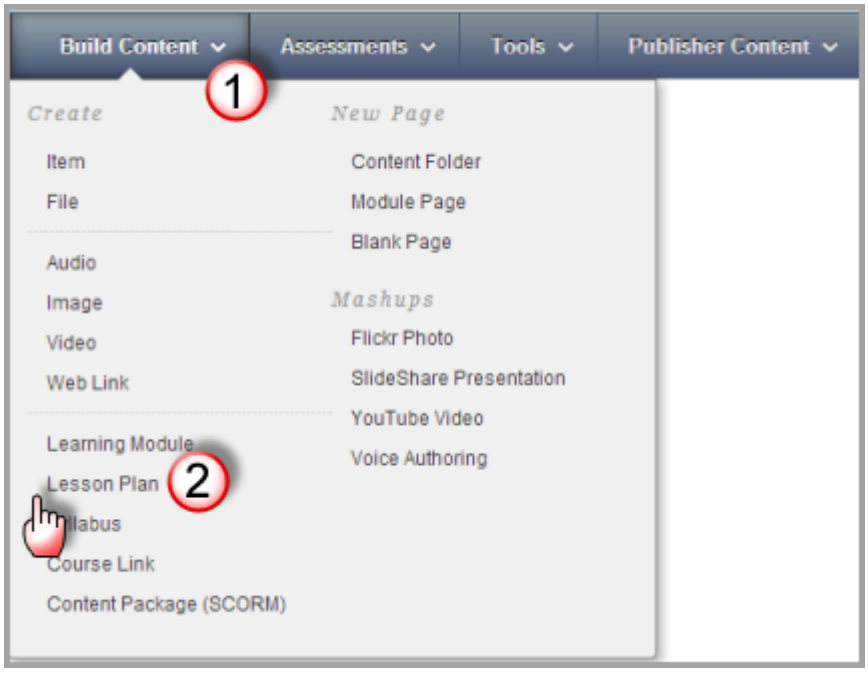
Instructor can create a lesson plan through this page. Instructor can create a plan for a certain lesson, week, day,...etc. In addition, s/he can create all material related to that plan. In addition, instructor can use it for different purposes during course organization to reach certain organizational objectives. This can occur by using the Lesson Plan features but to adapt to certain needs that serves course organization.

Lesson Plan can be used for giving instructions to students.

To create a lesson plan, follow these steps:

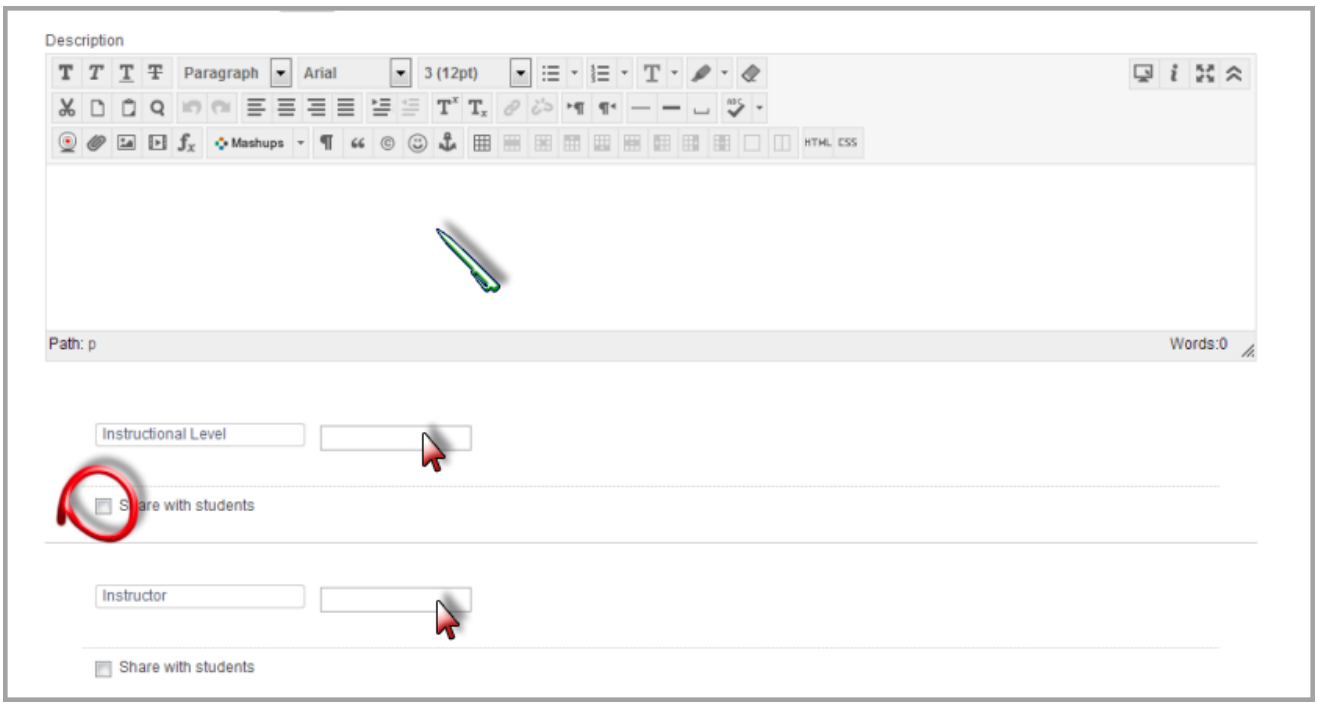
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Lesson Plan**"

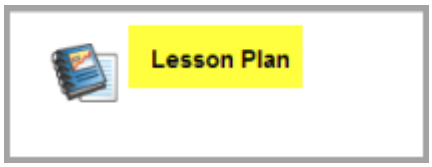


- A page appears as follows:

- Select lesson plan sectors by clicking on "**Add Lesson Plan**" as shown above.



- Insert all desired data then click on "**Share with students**" so that all students can view the info.
- Press "**Save and Continue**" in order to save data and go to curriculum resources.
- Press "**Ok**" to save all steps.
- Lesson plan appears as shown below:



12- How to add a content folder:

Remember:

Instructor can create a content folder through this page. Instructor can use content folder to add different items, files, audio, video, images, assignments... etc. It is used for course organization.

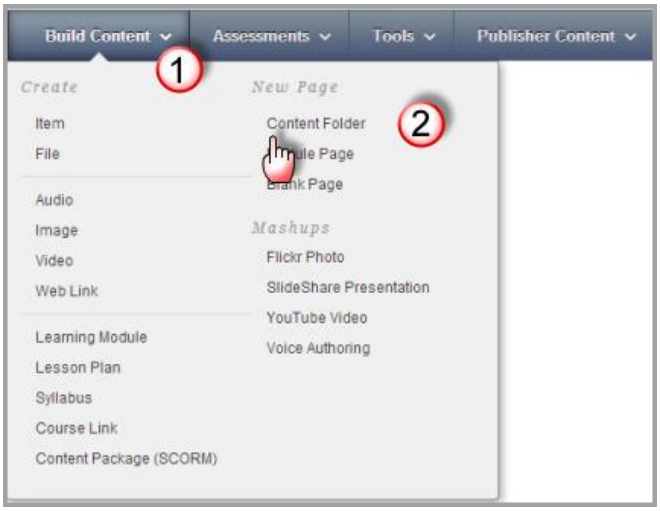
Note:

Do not forget to put instructions to students in order to know what to do with this material.

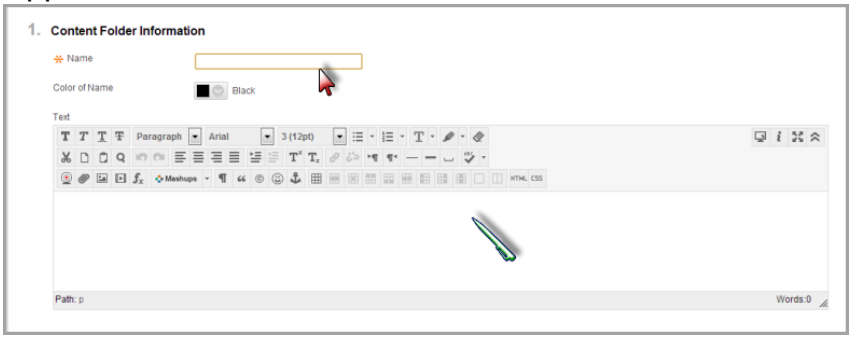
To create a folder, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

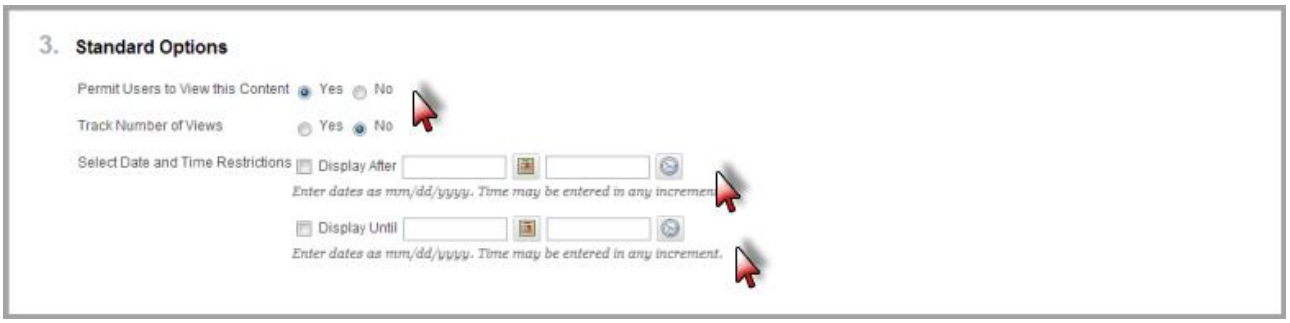
- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Content Folder**"



- A page appears as follows:



- Insert folder name in the "**Name**" text field.
- Select color of the folder name as desired.



- Click on the radio button next to "**Permit Users to view content**" in order to enable students' to view the folder.
- Click on the radio button next to "**Track Number of Views**" in order to monitor students' access to the folder.
- Select date/time of file display from "**Display After**" and "**Display Until**". (**Optional**)

- Press "**Submit**" in order to save the process and the new folder appears as follows:

13- How to add an assignment:

Remember:

Instructor can create assignments through this page. Automatic e-mail is sent to students for finishing their assignments. A column with the assignment name and grade is automatically created in the grade centre.

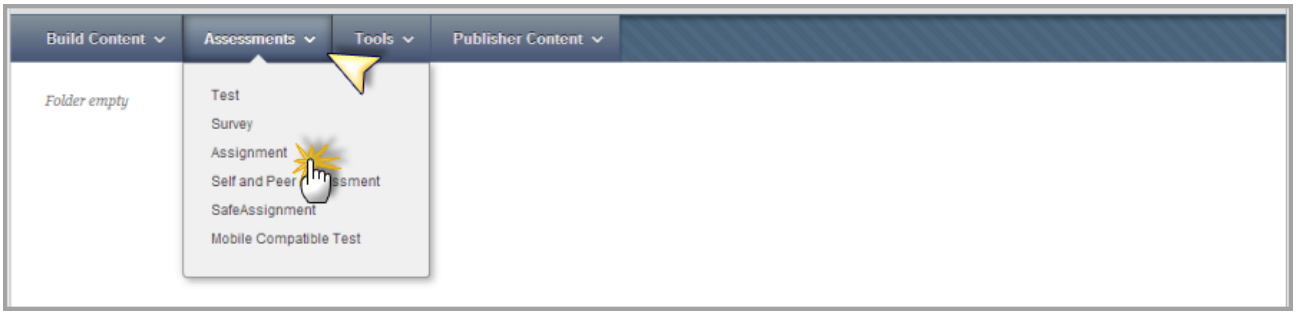
Note:

Do not forget to put instructions to students in order to know what to do with this material.

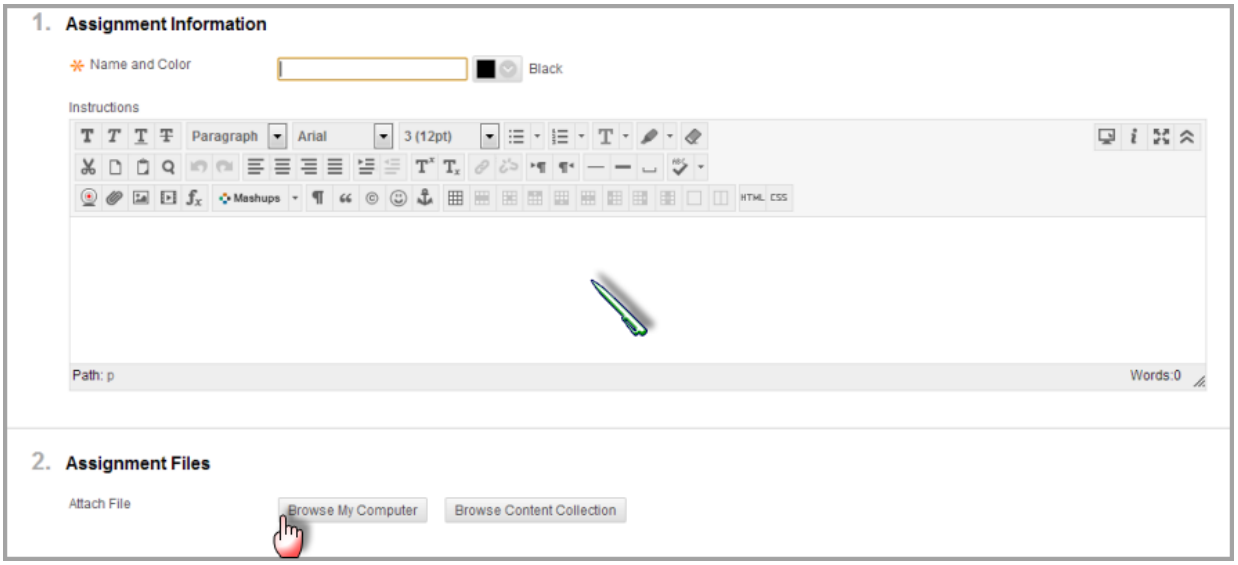
To create an assignment, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

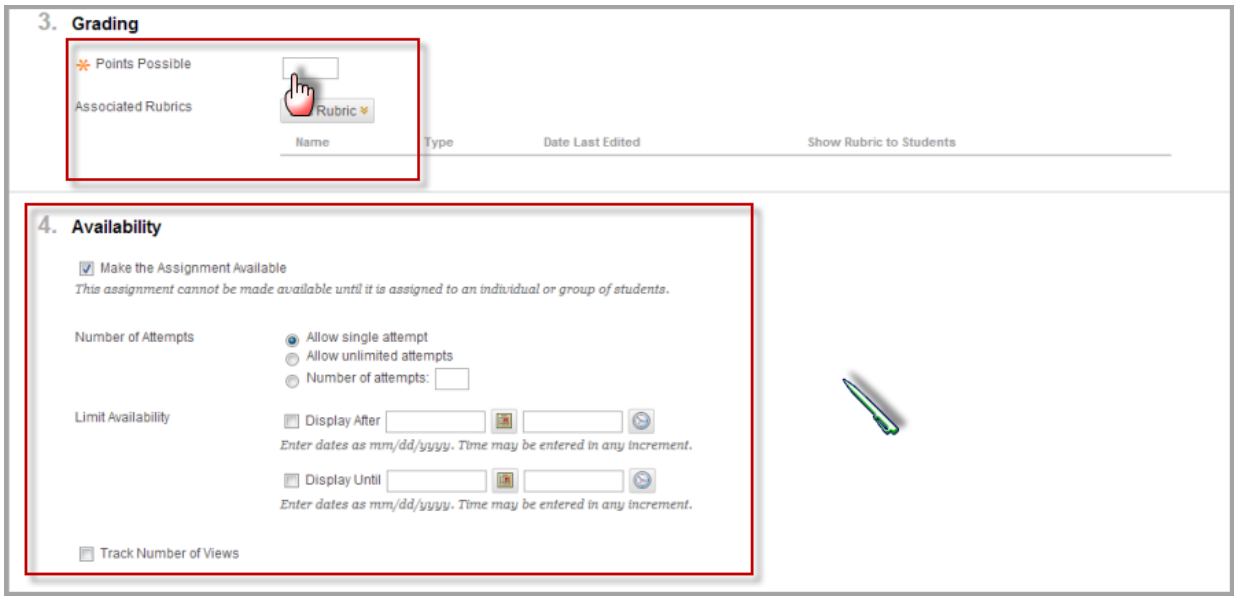
- Reminder: Go to Course Content
- First: Click on "**Assessments**"
- Second: Click on "**Assignment**"



- A page appears as follows:



- Insert file assignment details under the **Assignment Information**.
- You can attach any file by pressing "**Browse My computer**".



- Specify assignment grade and its availability from the above image.

- Specify due date of the assignment.
- Select whether you want to send the assignment to a group of students or all students individually.
  (Refer to Groups)
- Press "**Submit**" to save the process.

14- How to add a learning module:

Remember:

Instructor can create a learning module through this page. Learning Module has certain features that enables instructors to go through the content in a sequential form without skipping certain material in the middle. It is also used as a type of organization for the course.

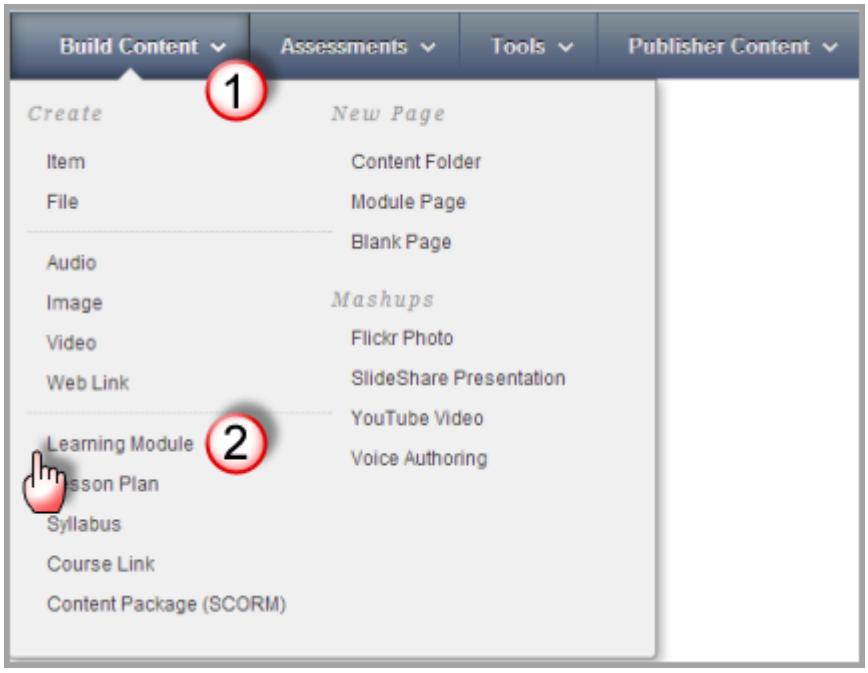
Note:

Do not forget to put instructions to students in order to know what to do with this material.

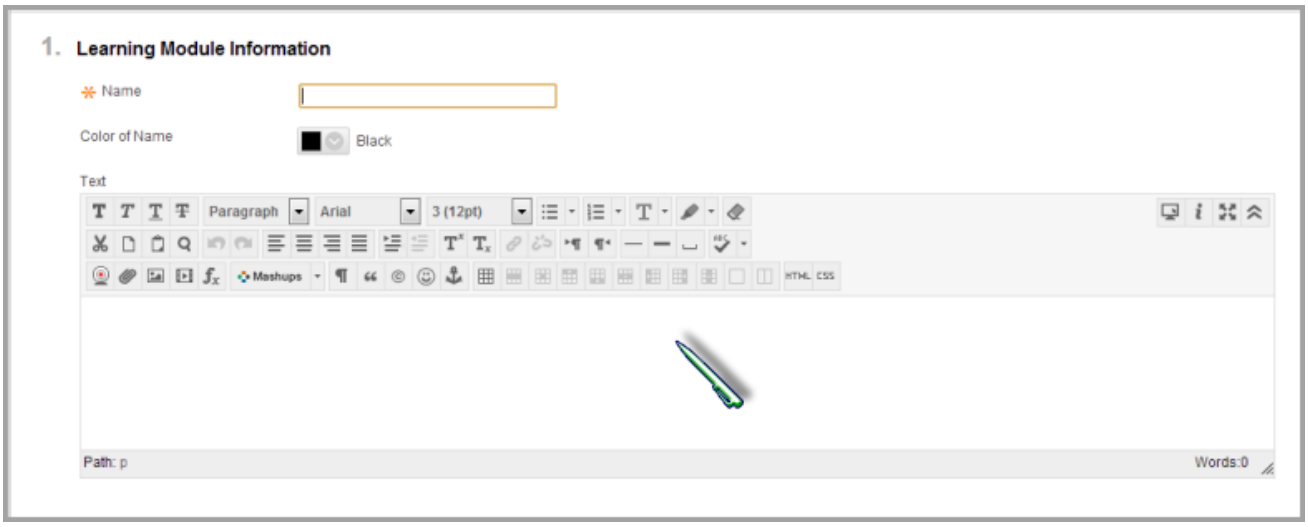
To create a Learning Module, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

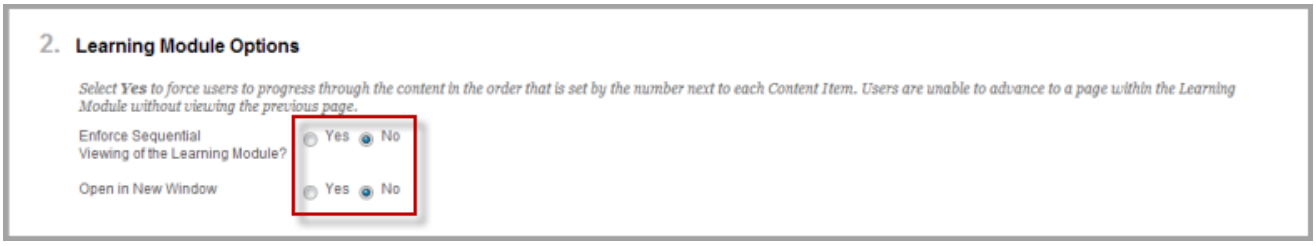
- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Learning Module**"



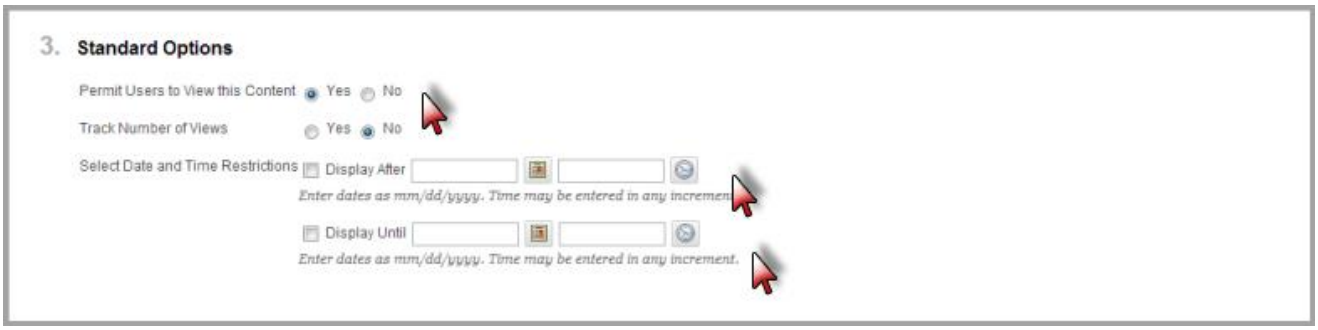
- A page appears as follows:



- Insert learning module name in the "**Name**" text field.
- Insert any text, video, audio, flash, web link, image, ...etc in the above text box.



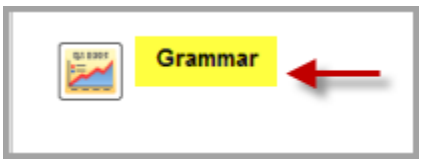
- Select learning module options such as enforce sequential view of content by clicking on the above radio button.



- Click on the radio button next to "**Permit Users to view content**" in order to enable students' to view the image.
- Click on the radio button next to "**Track Number of Views**" in order to monitor students' access to the image.
- Select date/time of file display from "**Display After**" and "**Display Until**". (**Optional**)

- Select options related to the table of content from the above image.

- Press "**Submit**" in order to save the process and the learning module appears as follows:



- Click on the learning module and the page appears as follows after creating its content:

15- How to add a course link:

Remember:

Instructor can create a course link through this page. Course link is created in order to enable students allocate certain material inside the course.

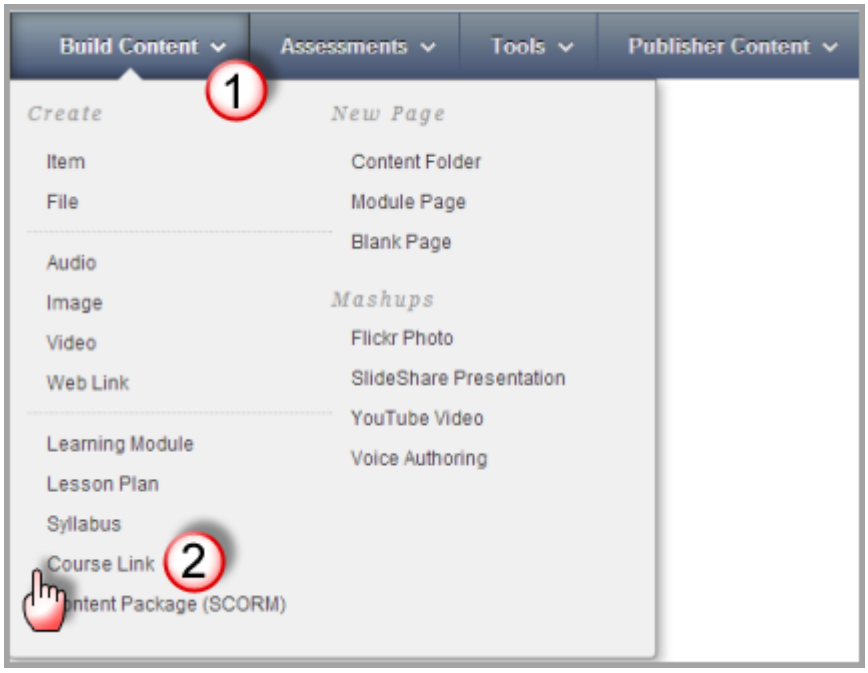
Note:

Do not forget to put instructions to students in order to know what to do with this material.

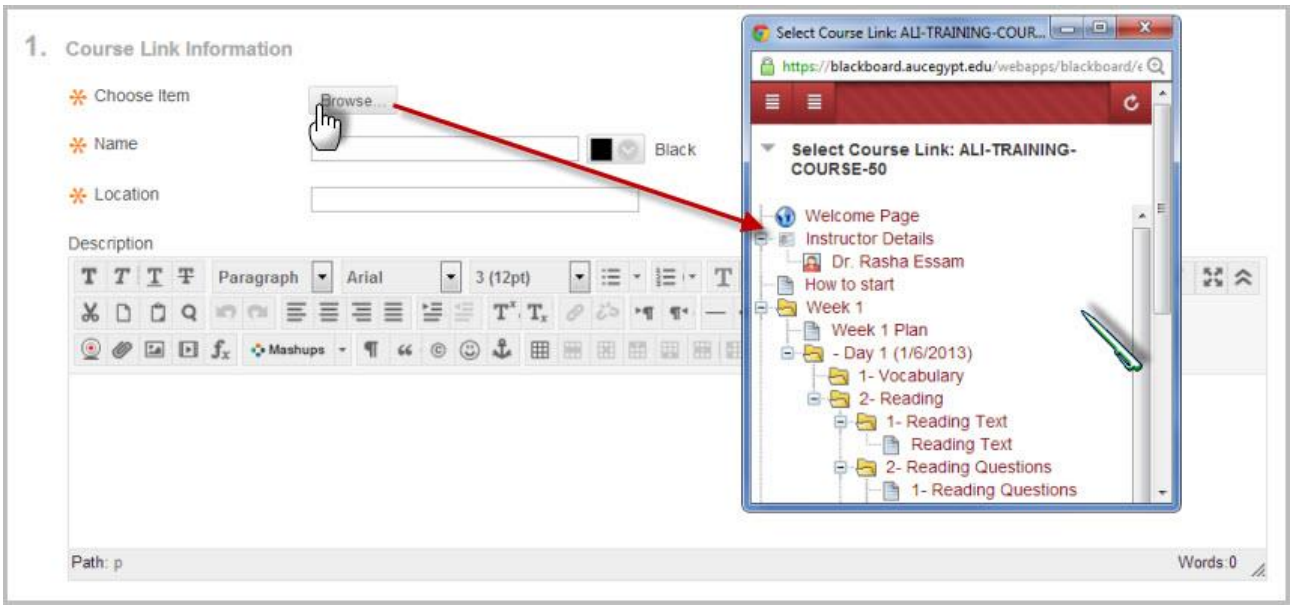
To add a course link, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Course Link**"



- A page appears as follows:



- Insert course link name in "**Name**" text field.
- Press "**Browse**" in order to select desired material already inserted in the course as shown above.

- Press "**Submit**" to save the process.

16- How to add a web link:

Remember:

Instructor can divert students to a certain web address through this page.

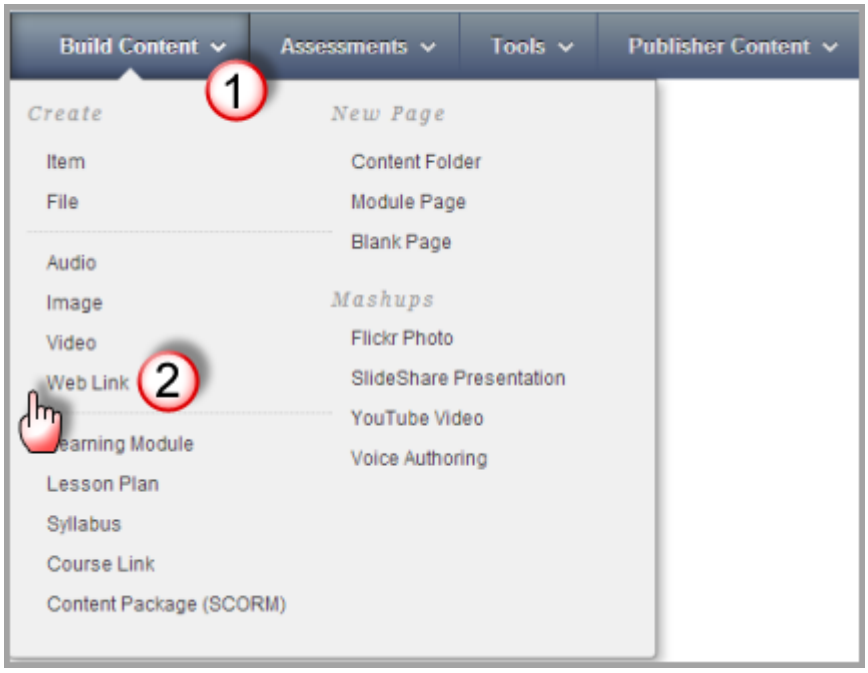
Note:

Do not forget to put instructions to students in order to know what to do with this material.

To add a web link, follow these steps:

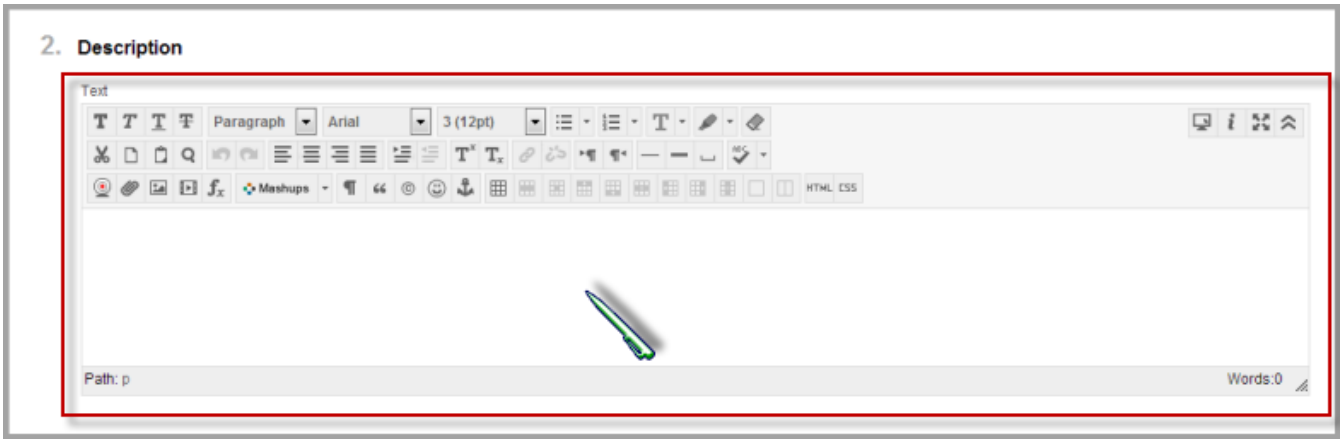
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Web Link**"



- A page appears as follows:

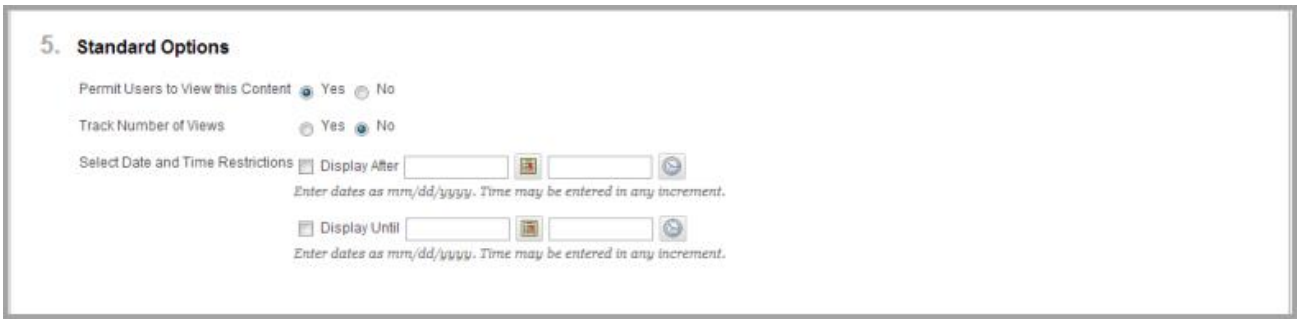
- Insert link name in the "**Name**" text field.
- Insert link web address in the "**URL**" text field.



- Insert any text, video, audio, flash, web link, image, ...etc in the above text box.

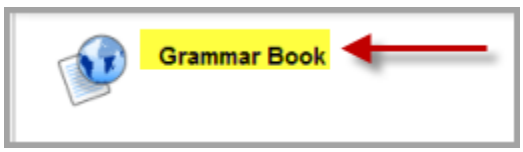
- Attach any file (s) from your drive by pressing "**Browse My Computer**".
- Attach any file (s) from your blackboard content by pressing "**Browse Content Collection**".

- Select web options from above radio buttons.



- Click on the radio button next to "**Permit Users to view content**" in order to enable students' to view the image.
- Click on the radio button next to "**Track Number of Views**" in order to monitor students' access to the image.
- Select date/time of file display from "**Display After**" and "**Display Until**". (**Optional**)

- Press "**Submit**" in order to save the process and the web link appears as follows:



How to add a blank page:

Remember:

Instructor can create a blank page to be seen by students through this page.

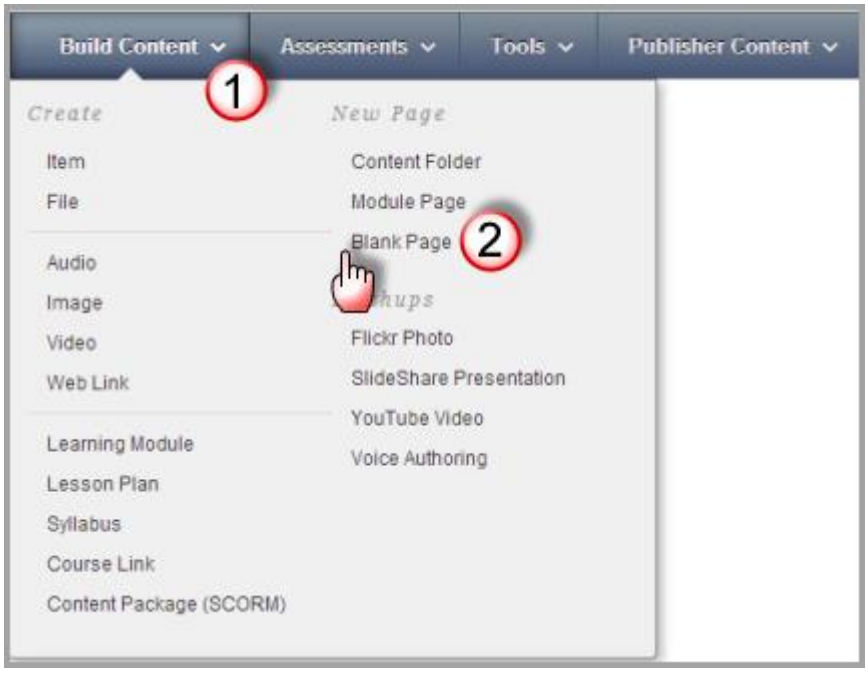
Note:

Do not forget to put instructions to students in order to know what to do with this material added to the page.

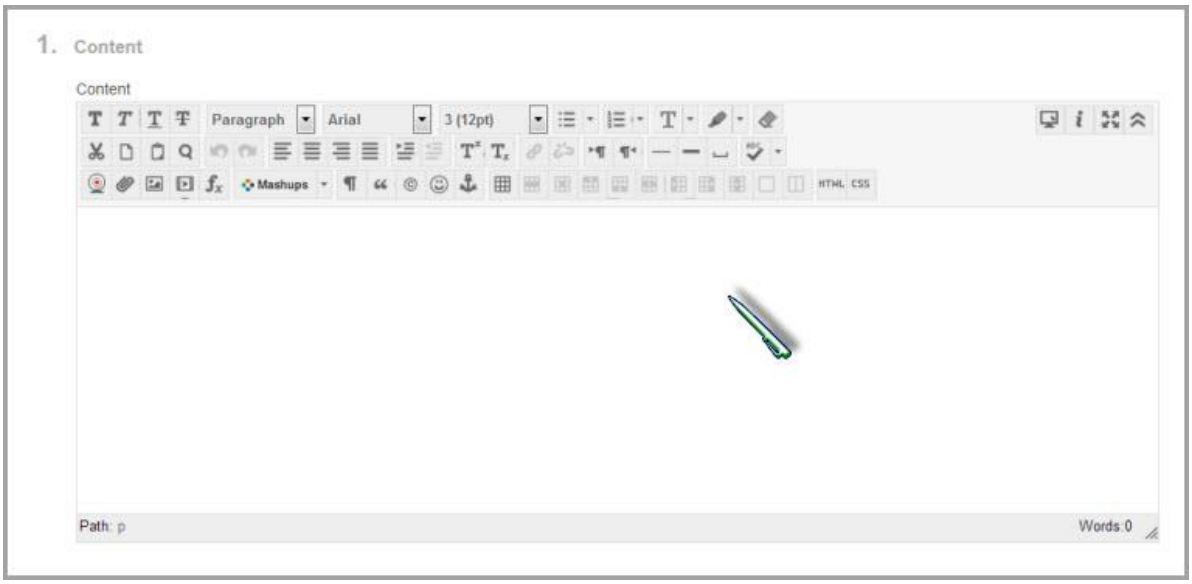
To create a blank page, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Build Content**"
- Second: Click on "**Blank Page**"



- A page appears as follows:

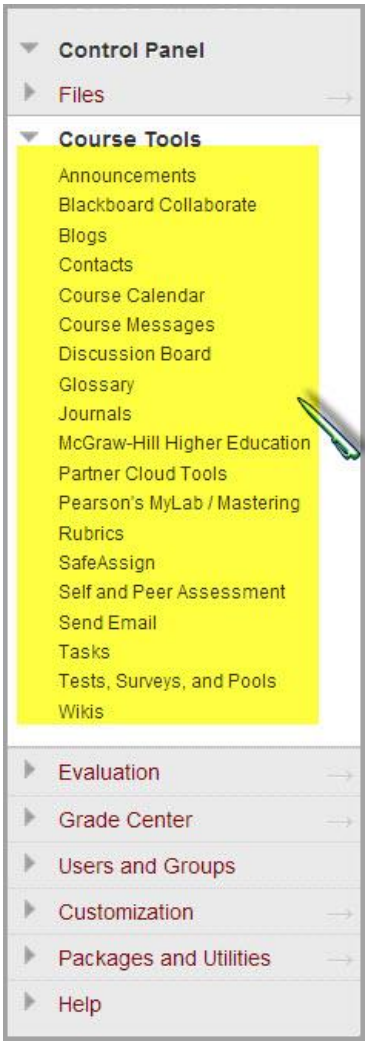


- Insert whatever you want in the above content editor.
- You can also attach any files to the blank page by pressing "**Browse My Computer**" or "**Browse Content Collection**".
- Press "**Submit**" in order to save the process.

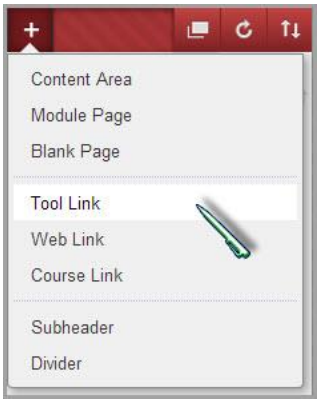
17- Important information about tools:

You can access blackboard Tools from three different ways as follows:

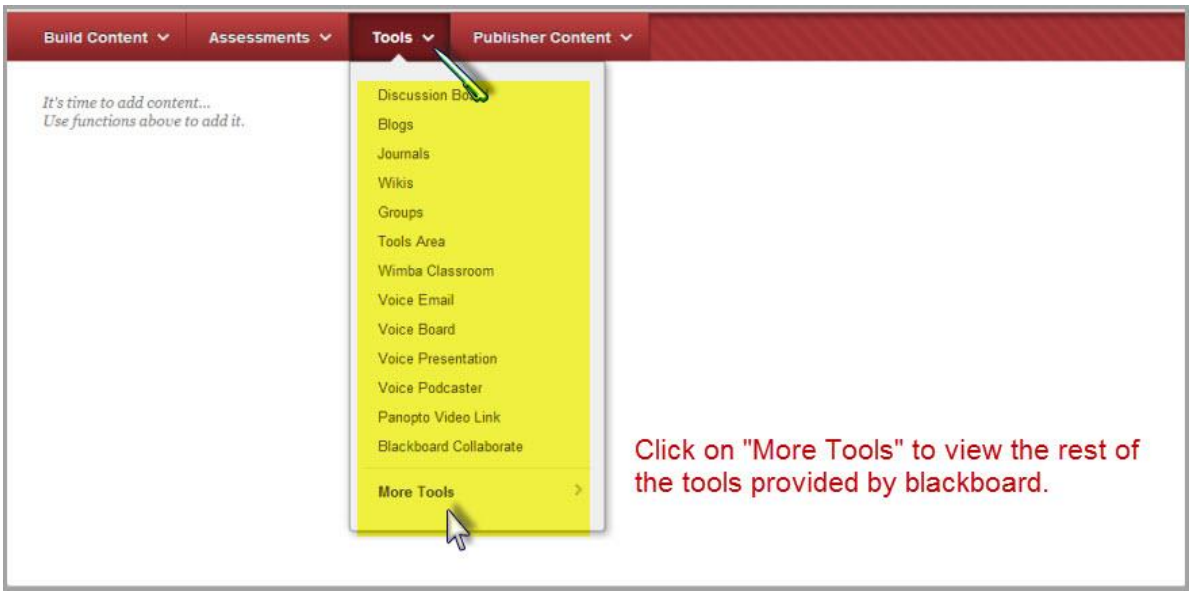
First



Second



Third

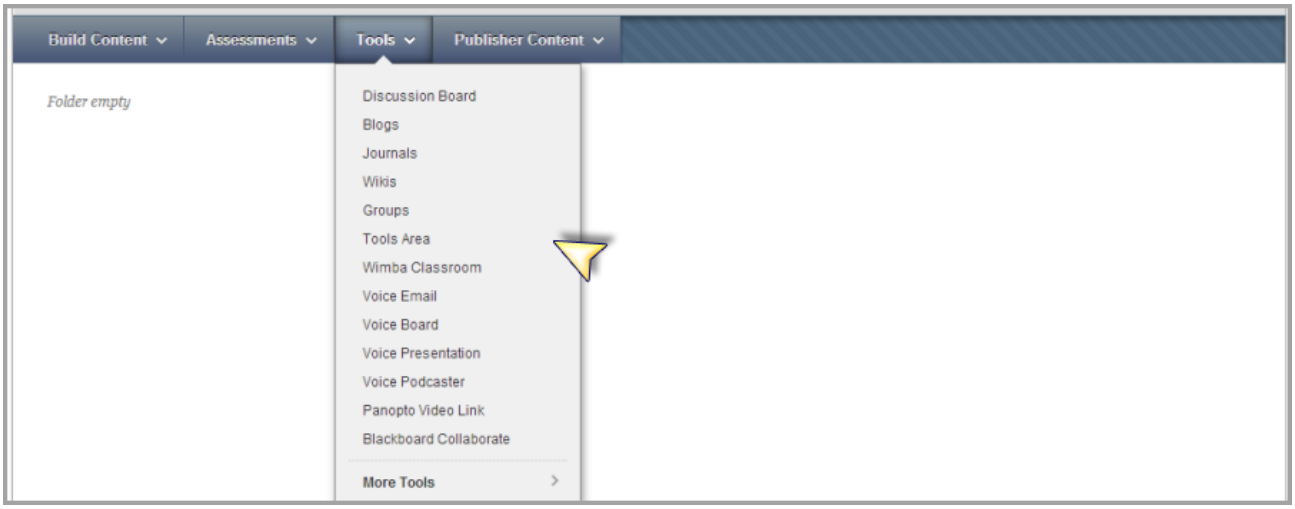


18- How to a discussion board:

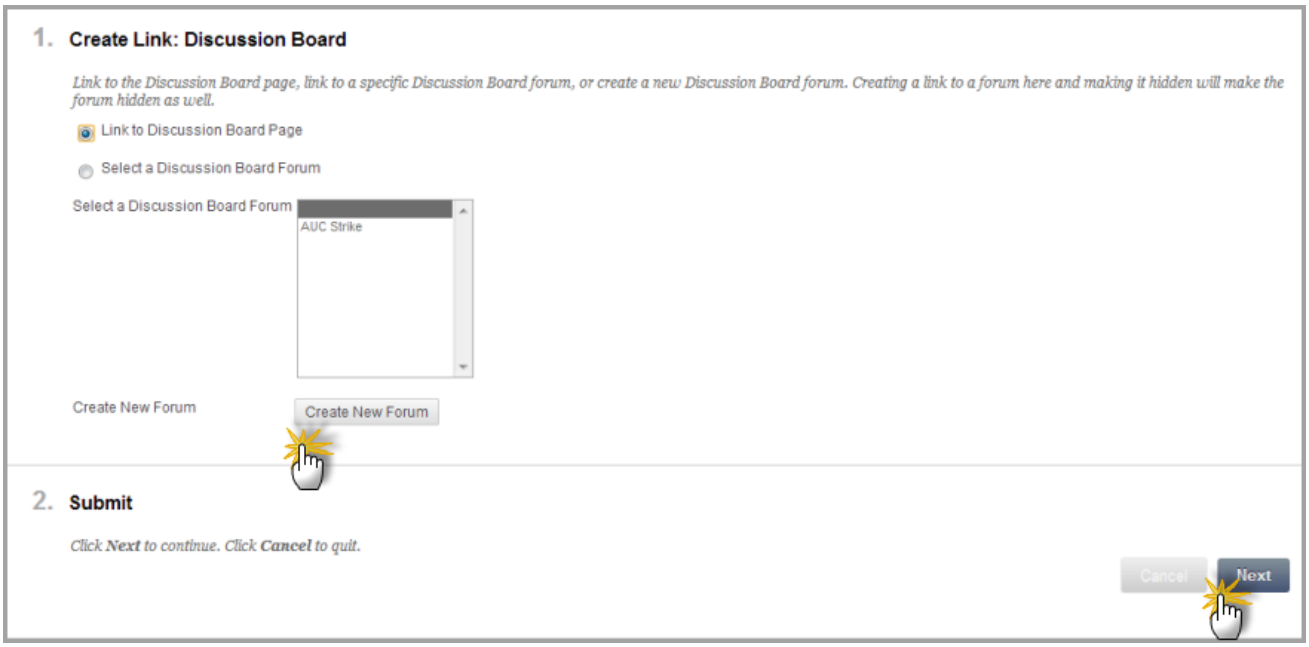
To create a discussion board, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

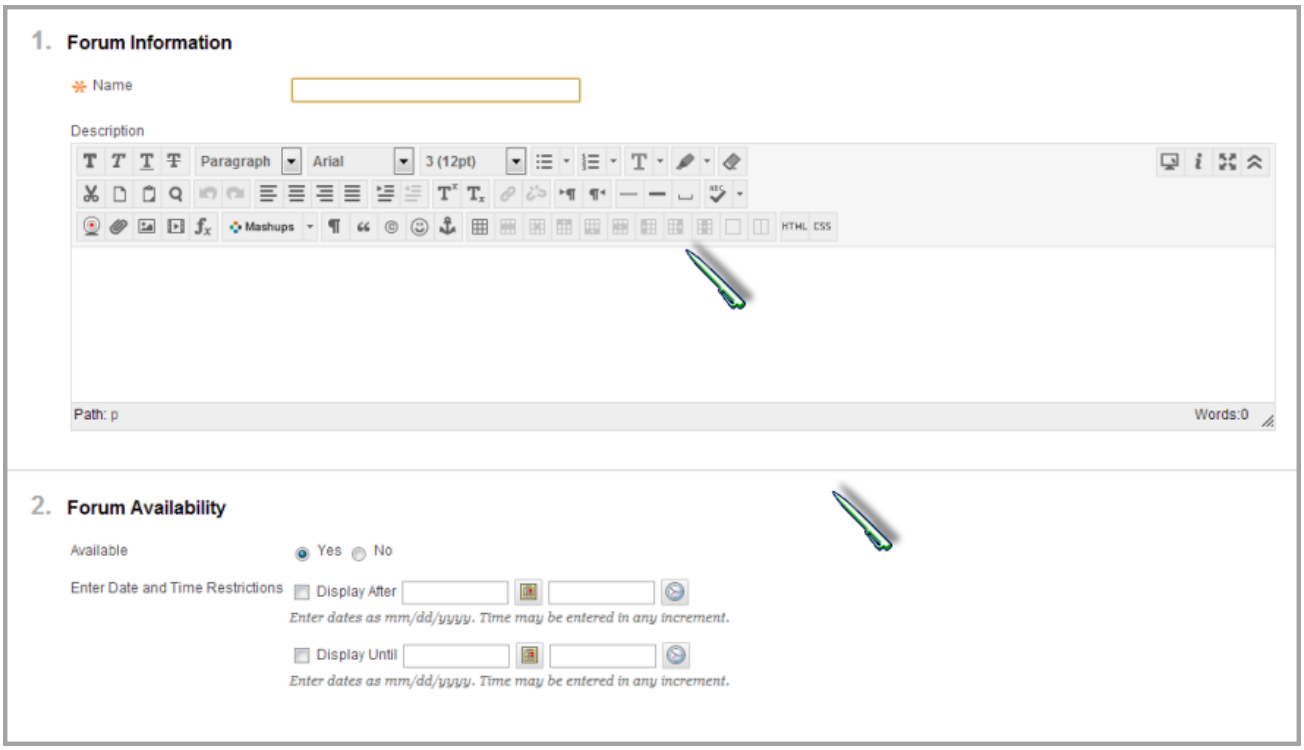
- Reminder: Go to Course Content
- First: Click on "**Tools**"
- Second: Click on "**Discussion Board**"



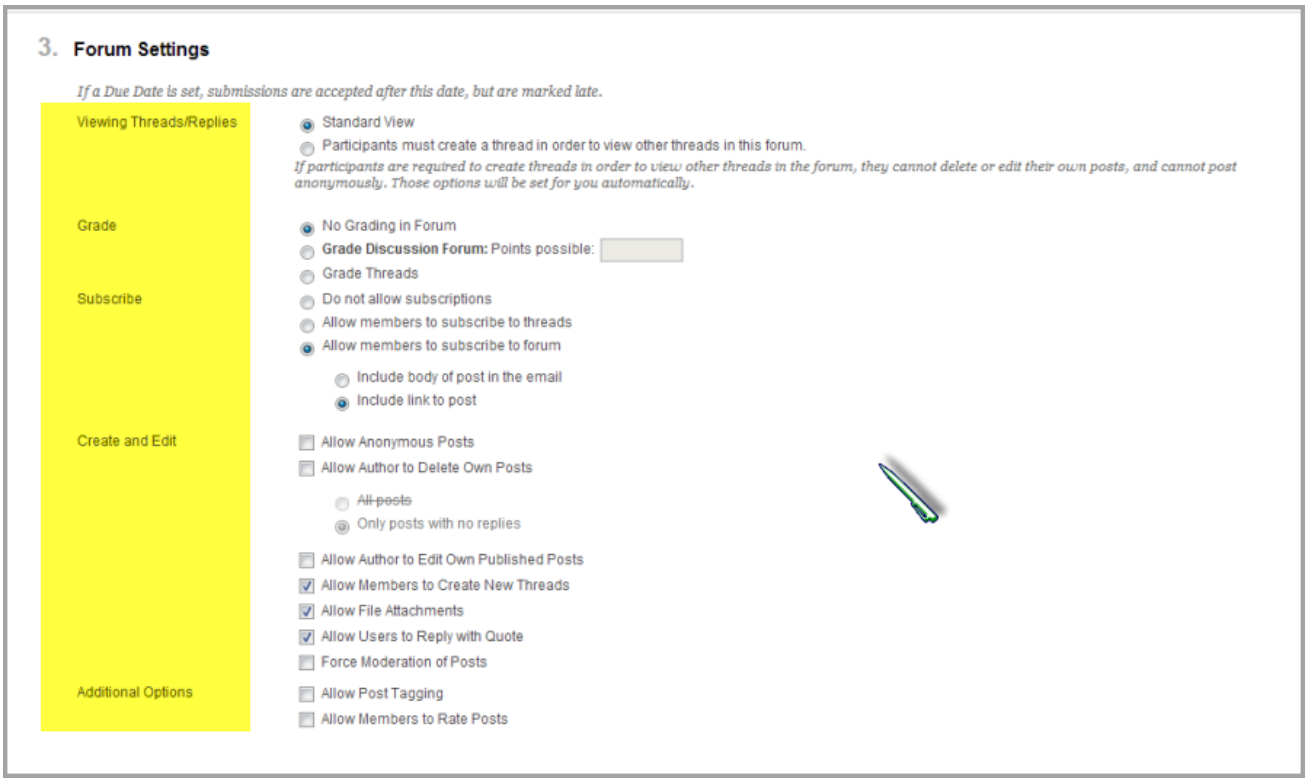
- A page appears as follows:



- Press "**Create New Forum**" in order to create a new forum as follows:



- Specify forum info and availability.



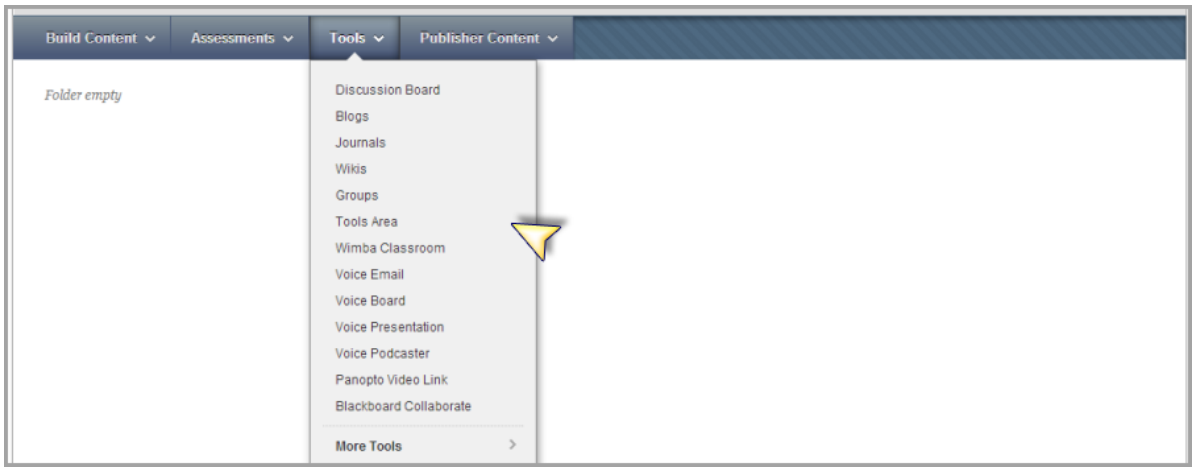
- Specify forum settings as shown above.

19- How to create a wiki:

To create a Wiki, follow these steps:

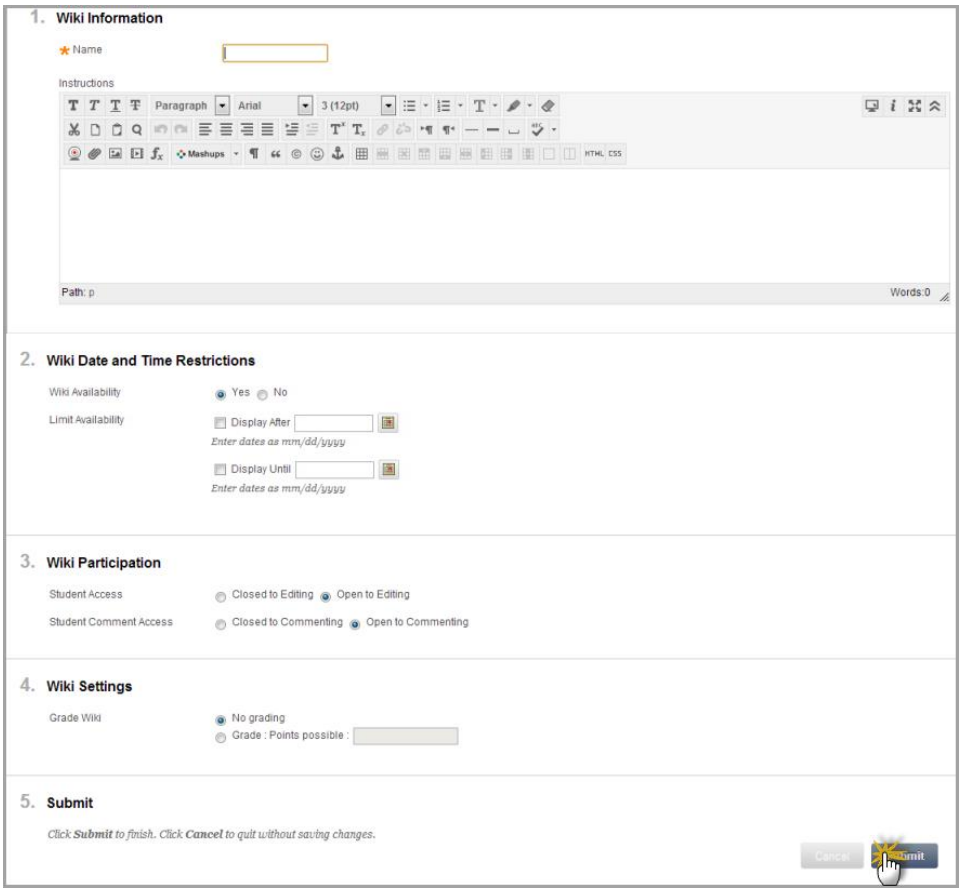
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Tools**"
- Second: Click on "**Wikis**"



- A page appears as follows:

- Press "**Create New Wiki**" in order to create a new one as follows:



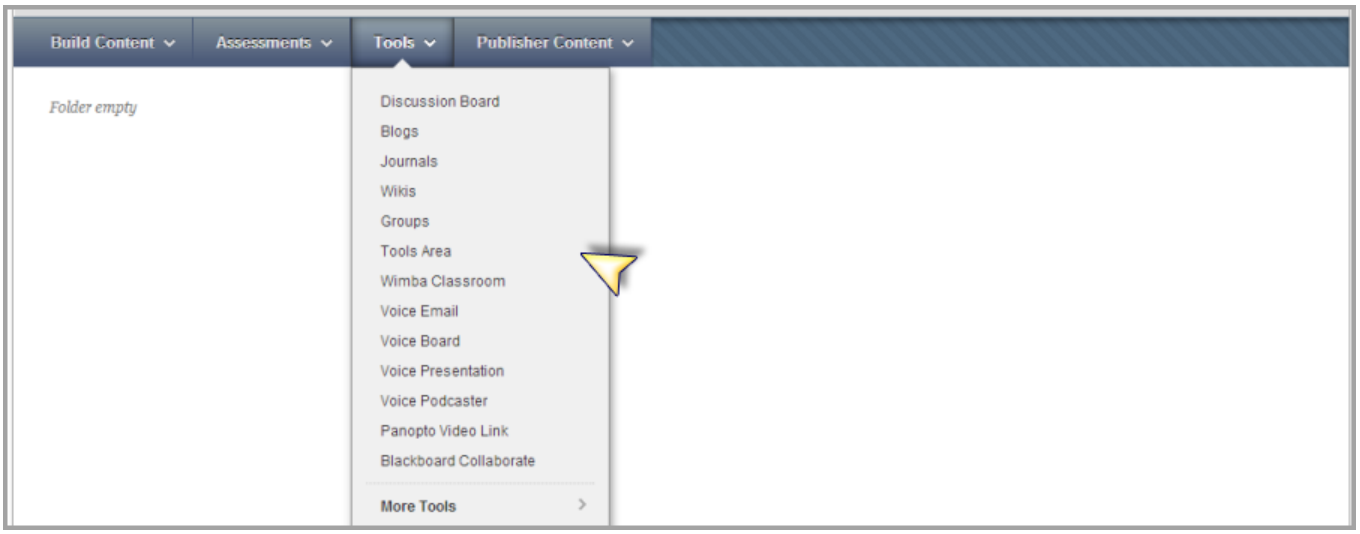
- Specify wiki settings and availability as shown above.
- Press "**Submit**" to save the process.

20- How to create a blog:

To create a blog, follow these steps:

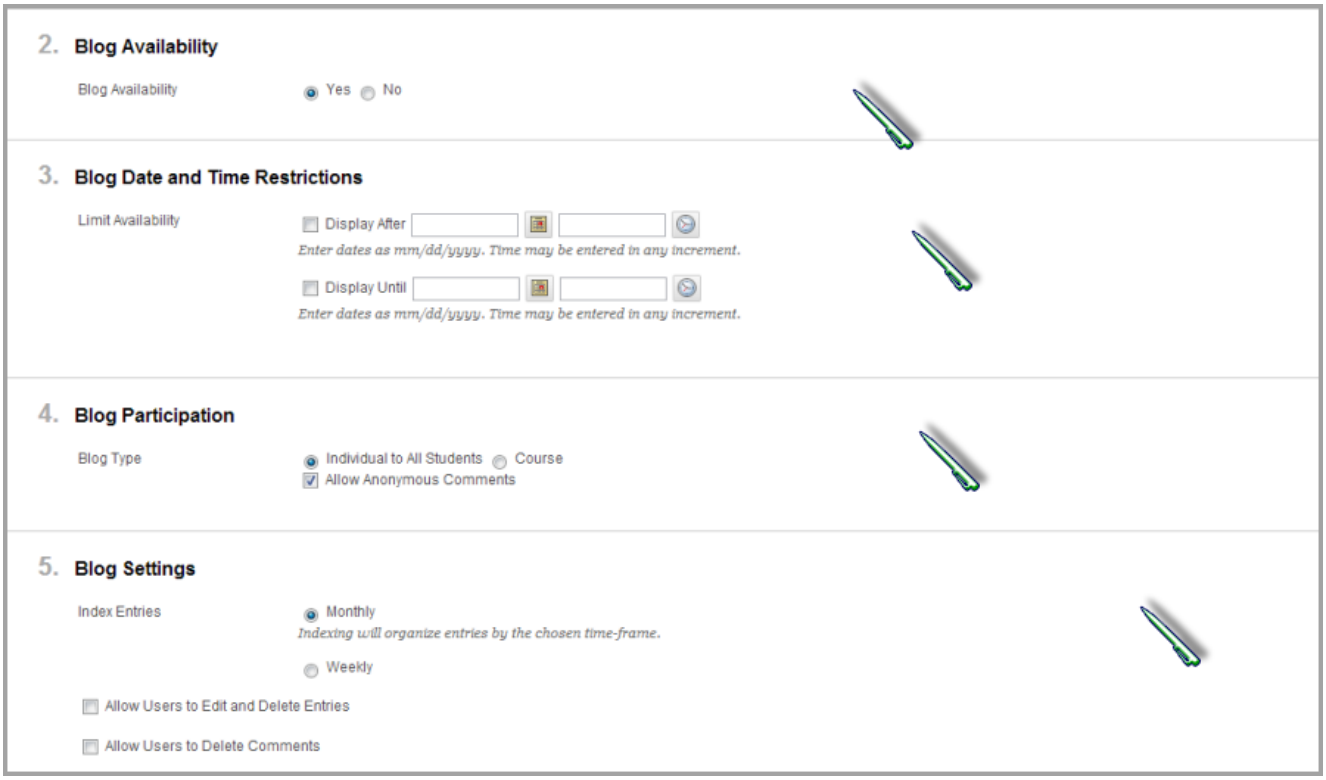
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Tools**"
- Second: Click on "**Blogs**"

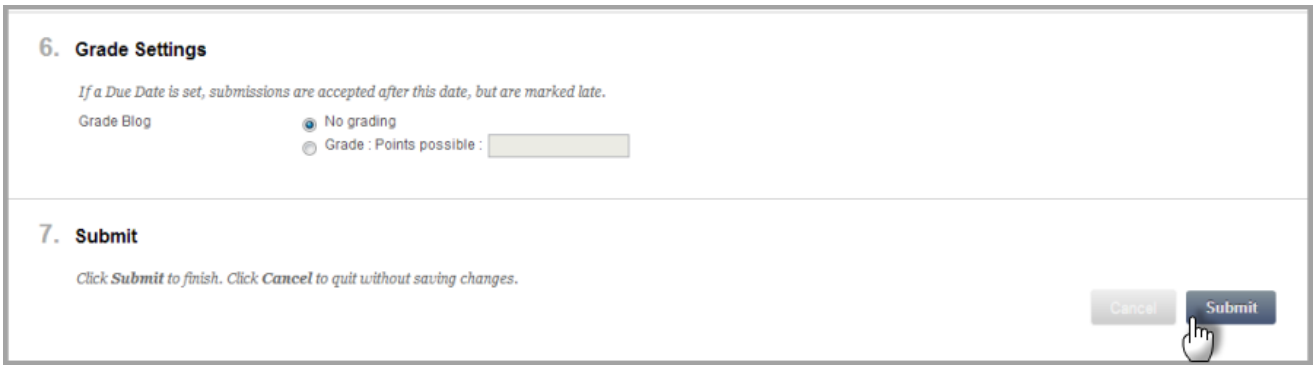


- A page appears as follows:

- Press "**Create New Blog**" in order to create a new one as follows:



- Specify blog settings and availability as shown above.



- Specify grade settings then press "**Submit**".

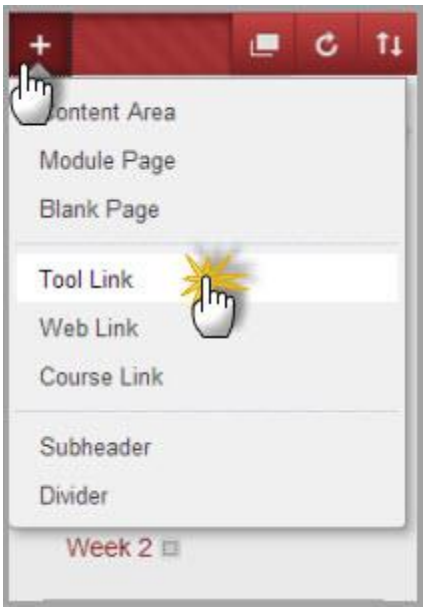
21- How to show the calendar:

To add calendar, follow these steps:

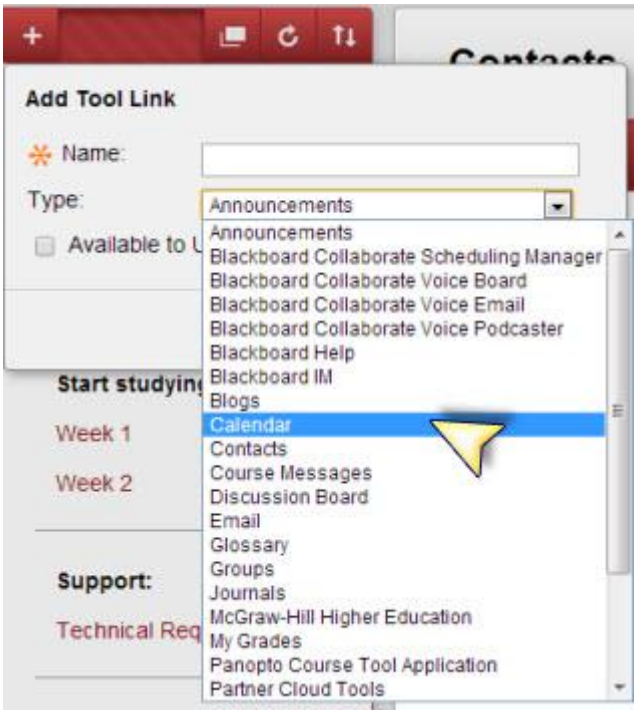
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

First Step

- Click on the plus sign as shown below:



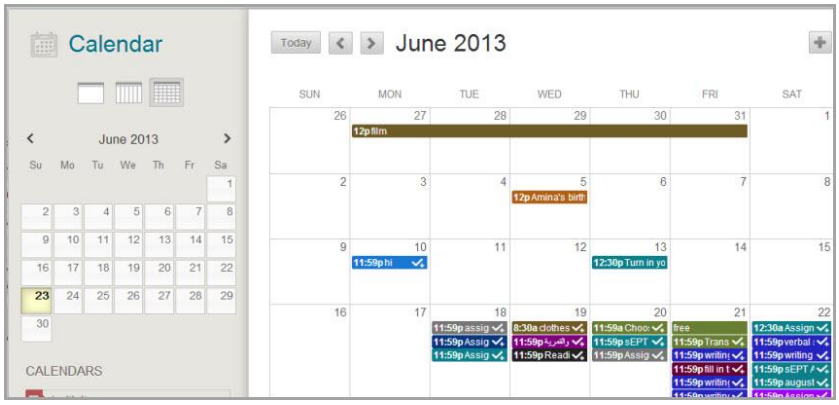
- Click on "**Tool Link**" and a window appears as follows:



- Insert desired name that appears in the menu in the Name text field.
- Click on the drop down menu and select "**Calendar**".
- Click on the check box next to "**Available to users**" in order to visible to students.

Second Step

- Double Click on the link after being added to the left menu and a page will appear as follows:



22- How to create announcements:

Remember:

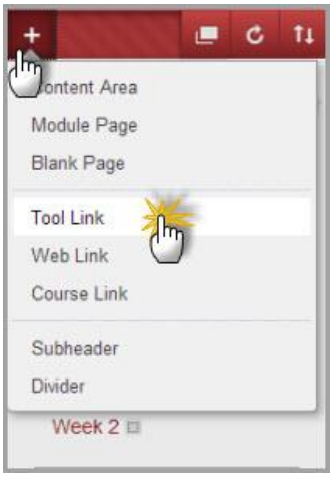
Tool Links are created in order to create links in the menu to the tools embedded in blackboard.

To create an announcement as a link in the left menu, follow these steps:

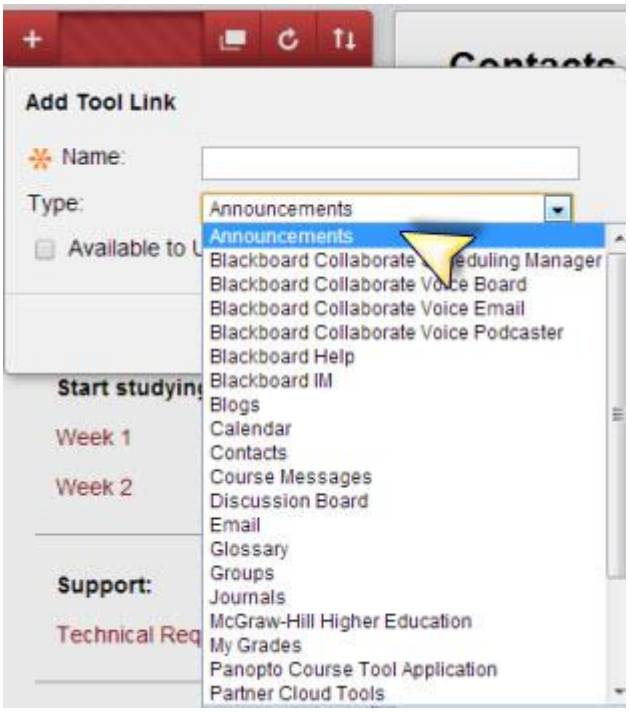
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

First Step

- Click on the plus sign as shown below:



- Click on "**Tool Link**" and a window appears as follows:



- Insert desired name that appears in the menu in the Name text field.
- Click on the drop down menu and select "**Announcements**".
- Click on the check box next to "**Available to users**" in order to visible to students.

Second Step

- Double Click on the link after being added to the left menu and a page will appear as follows:

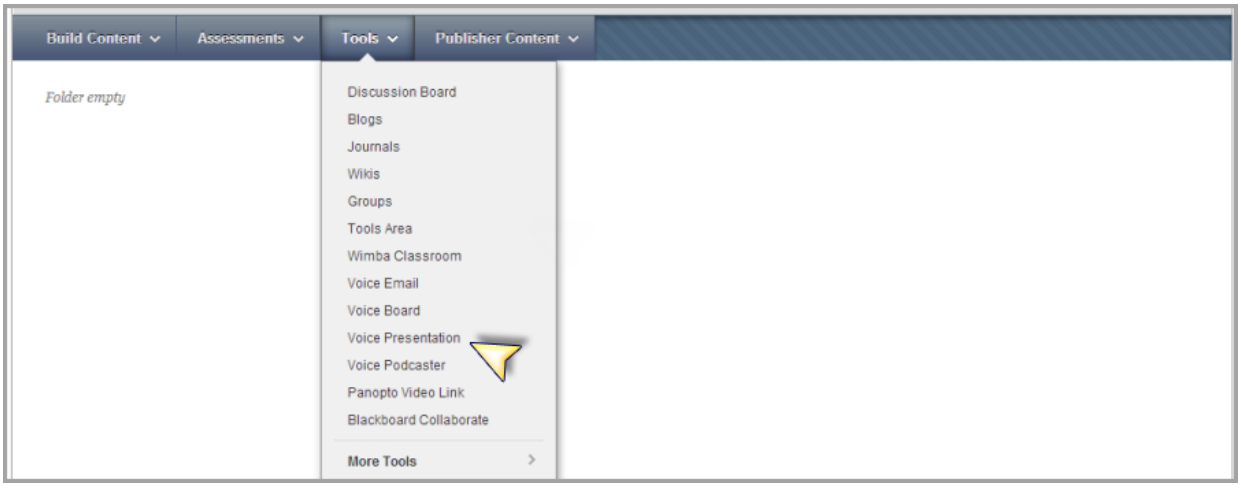
- Click on "**Create Announcement**" and a page will appear for creating an announcement.
- Press "**Submit**" to save the process.

23- **How to create voice presentations:**

To create a voice presentation, follow these steps:

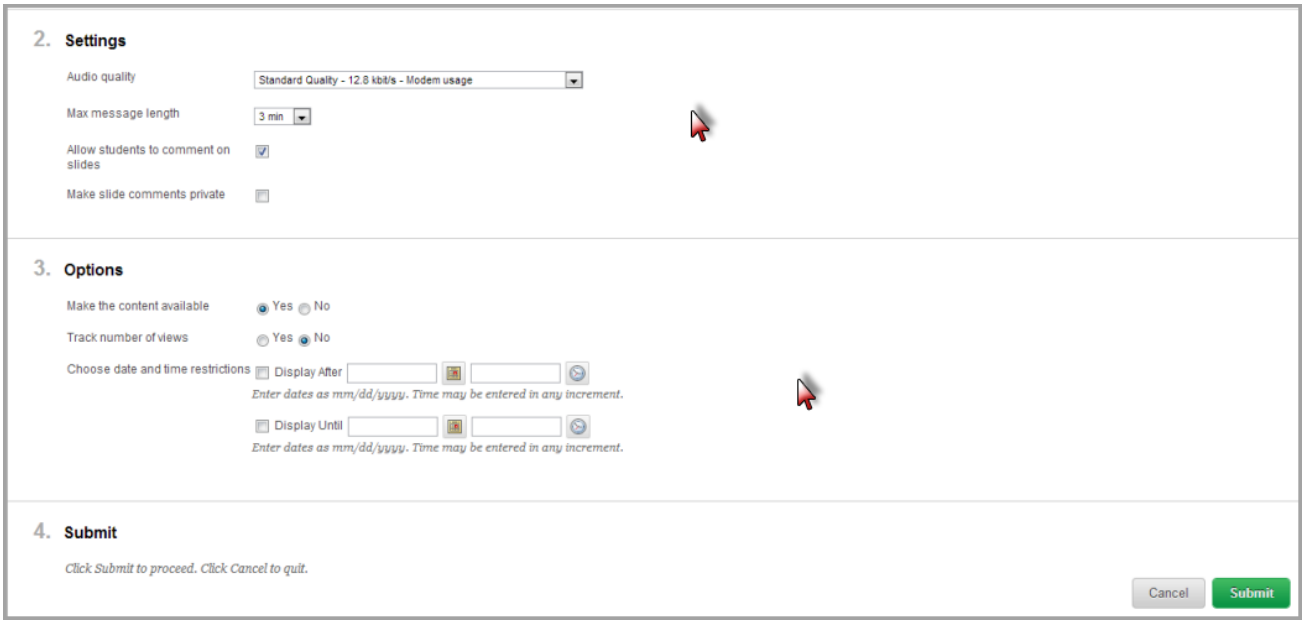
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

- Reminder: Go to Course Content
- First: Click on "**Tools**"
- Second: Click on "**Voice Presentation**"
- A page appears as follows:



- A page appears as follows:

- Specify voice presentation information and description from the above part.



- Specify voice options from the above part, then press "**Submit**" to save the changes.

- Click on "**New**" as shown above in order to create a new voice presentation and a window will appear for composing a voice presentation as follows:

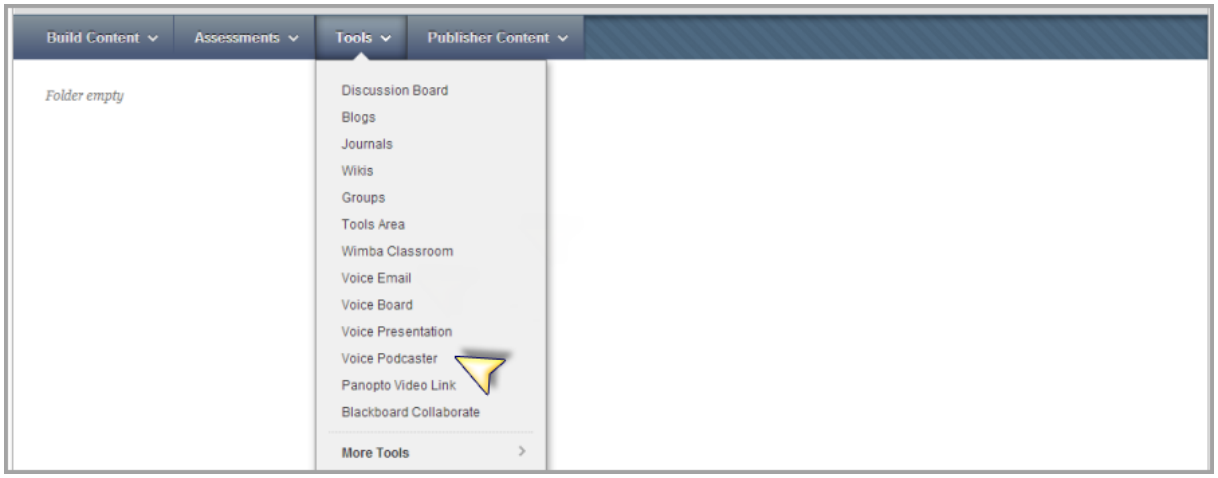
- Insert the subject of your presentation then click on the red button for recording.
- Press "**Post**" for submission.
- You can also add comments, delete voice presentations, and also edit them.

24- **How to create voice podcaster:**

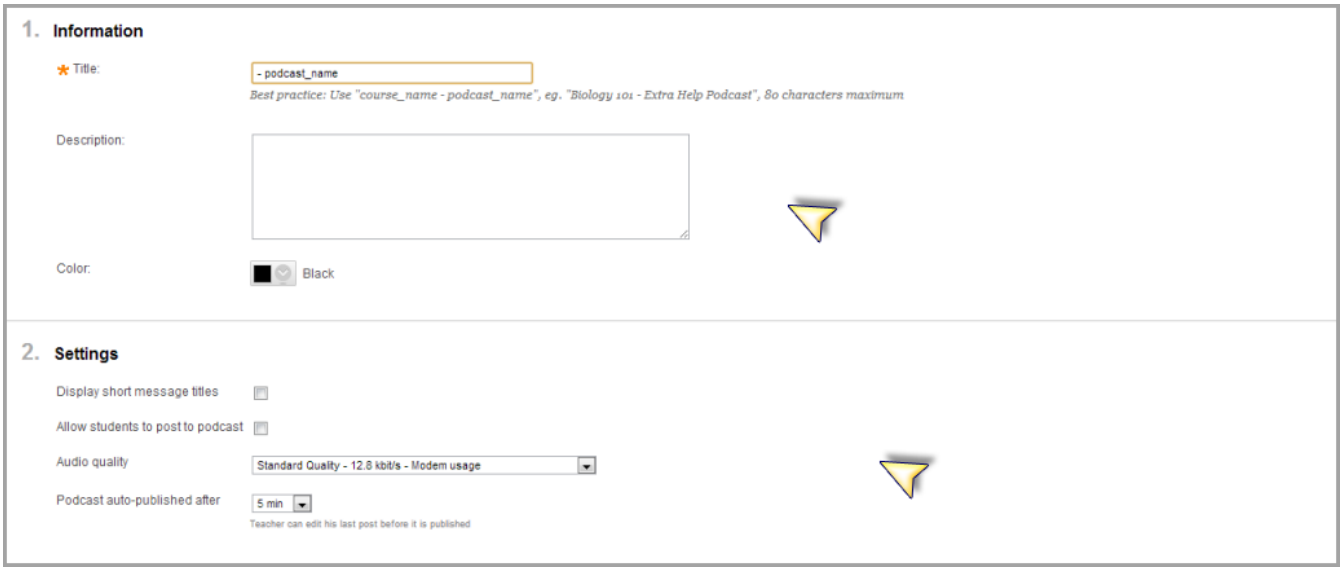
To create a voice podcaster, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

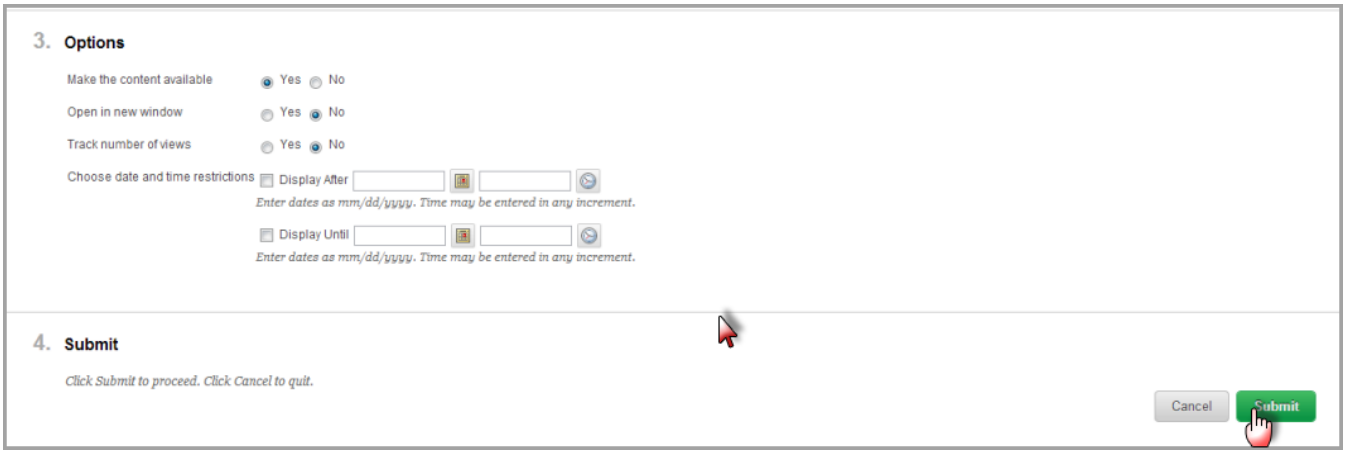
- Reminder: Go to Course Content
- First: Click on "**Tools**"
- Second: Click on "**Voice Podcaster**"
- A page appears as follows:



- A page appears as follows:



- Specify voice podcast information and settings from the above part.



- Specify voice options from the above part, then press "**Submit**" to save the changes.

25- **How to send emails:**

Remember:

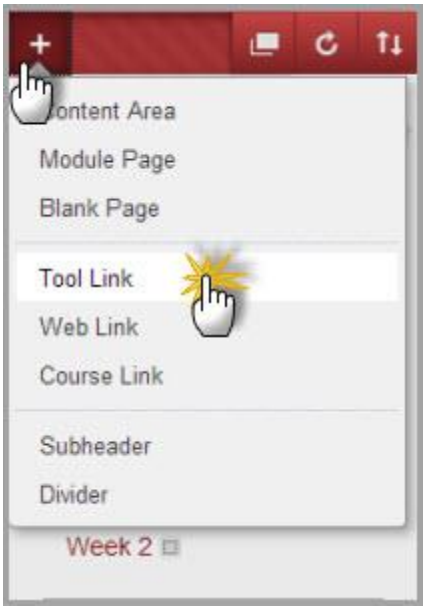
Tool Links are created in order to create links in the menu to the tools embedded in blackboard.

To create a quick link for sending emails to students in the left menu, follow these steps:

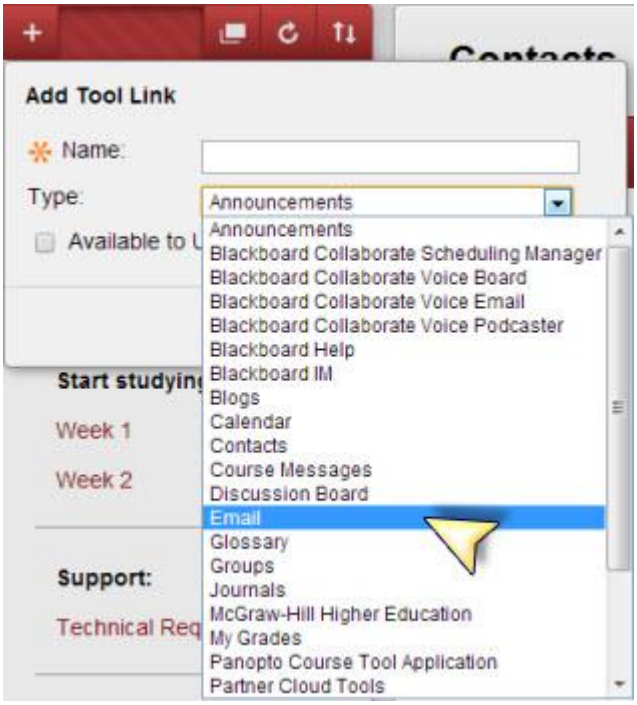
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

First Step

- Click on the plus sign as shown below:



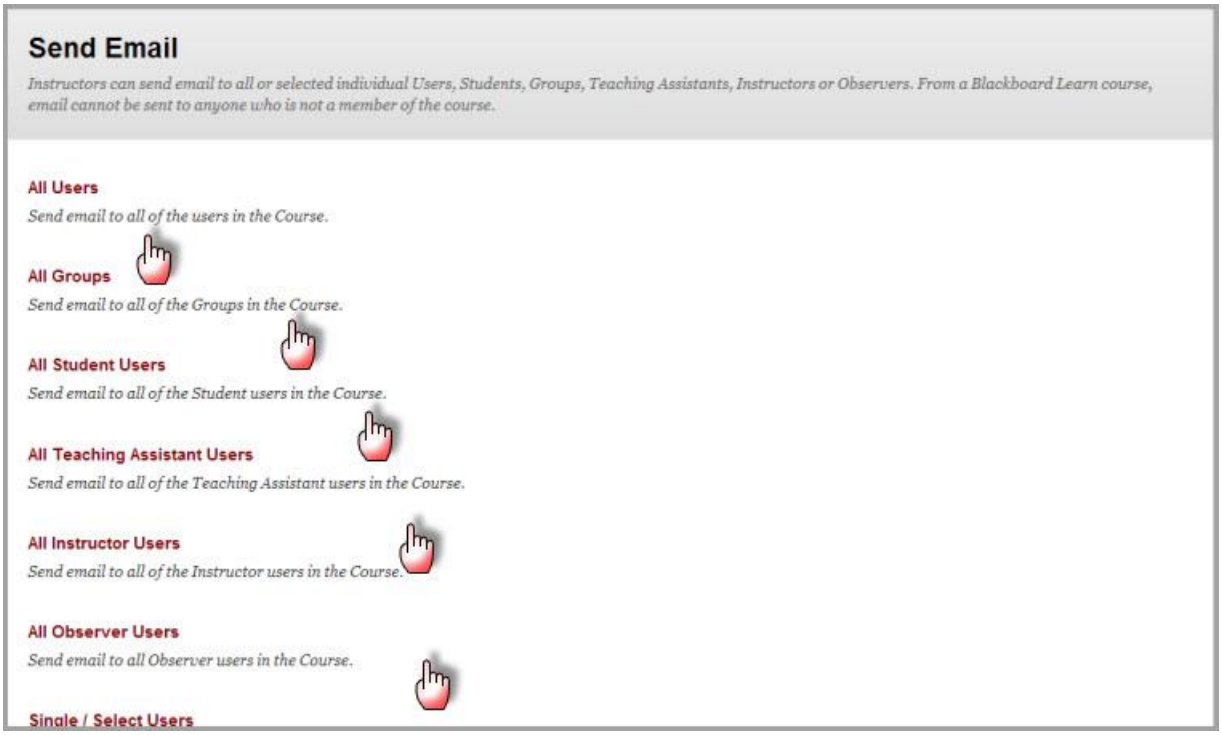
- Click on "**Tool Link**" and a window appears as follows:



- Insert desired name that appears in the menu in the Name text field.
- Click on the drop down menu and select "**Email**".
- Click on the check box next to "**Available to users**" in order to visible to students.

Second Step

- Double Click on the link after being added to the left menu and a page will appear as follows:



- Click on any of the above links in order to send e-mails to the desired student (s), instructor (s), observer (s).

26- **How to add instructor contact:**

Remember:

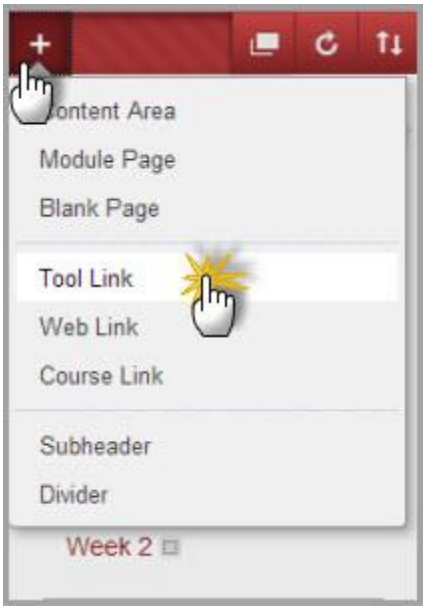
Tool Links are created in order to create links in the menu to the tools embedded in blackboard.

To add instructor contacts as a link in the left menu, follow these steps:

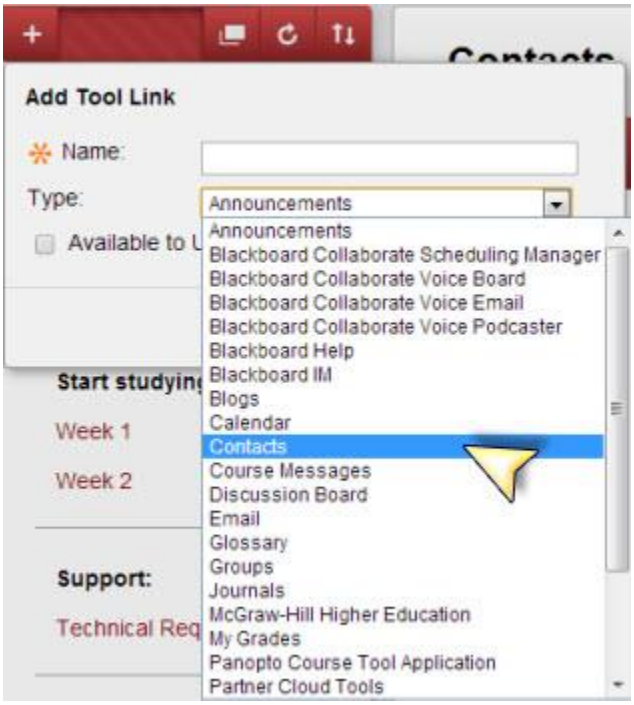
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

First Step

- Click on the plus sign as shown below:



- Click on "**Tool Link**" and a window appears as follows:

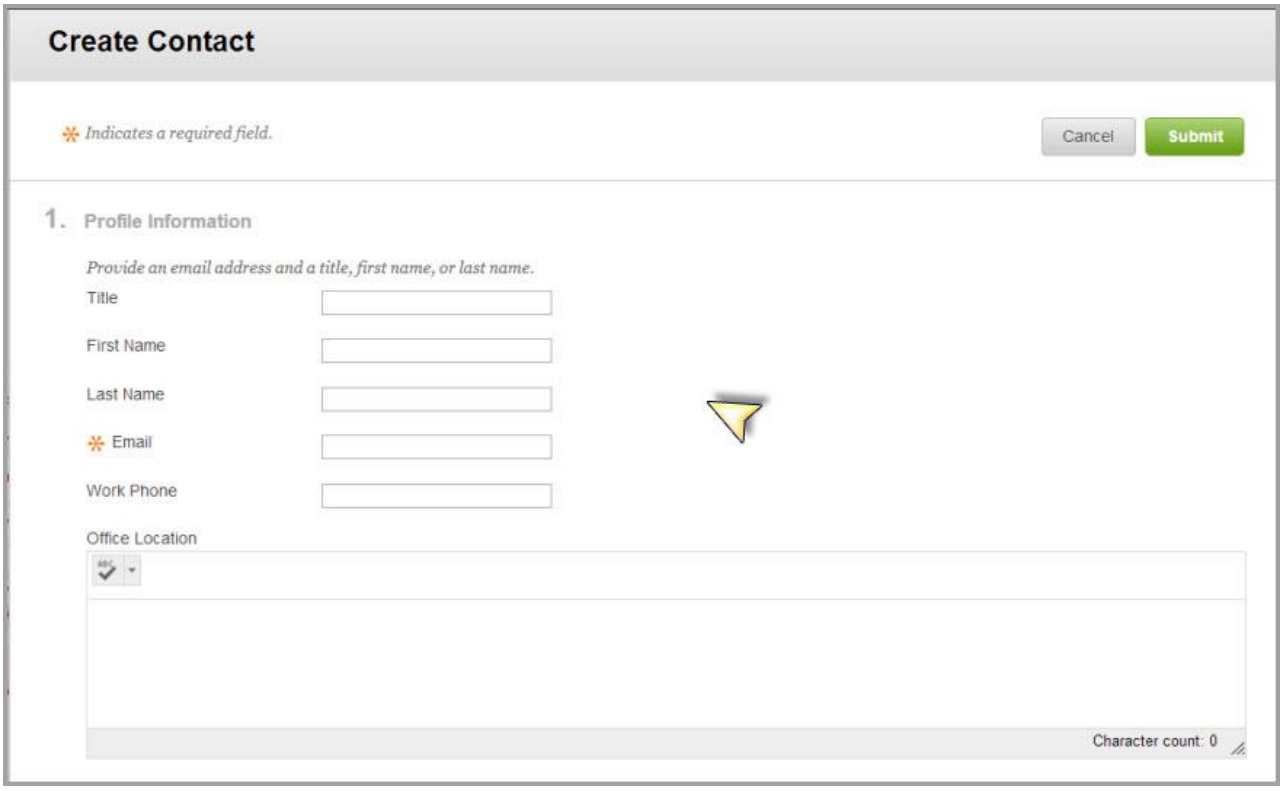


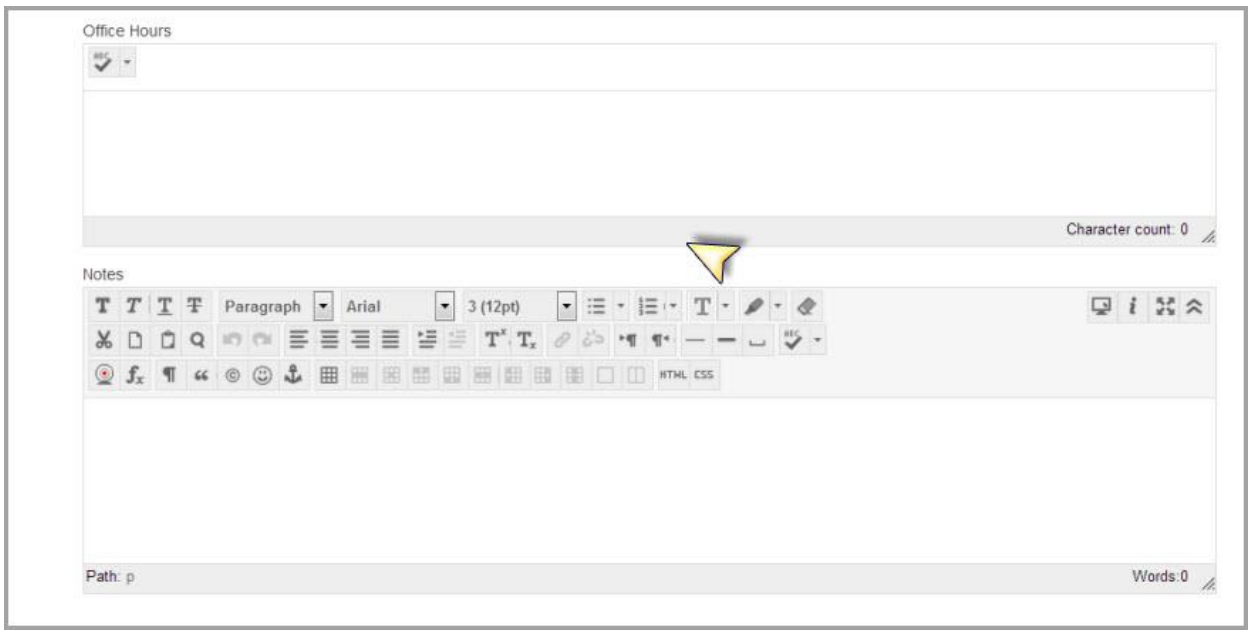
- Insert desired name that appears in the menu in the Name text field.
- Click on the drop down menu and select "**Contacts**".
- Click on the check box next to "**Available to users**" in order to visible to students.

Second Step

- Double Click on the link after being added to the left menu and a page will appear as follows:

- Click on "**Create Contact**" and a page will appear for creating contact details as follows:





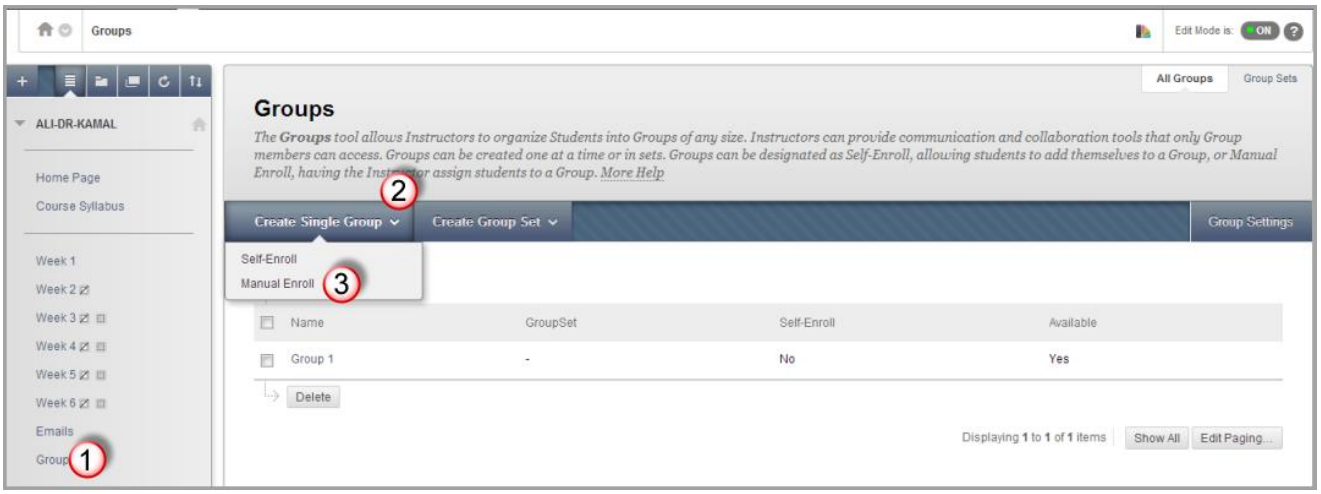
- Press "**Submit**" to save the process.

27- **How to create a group:**

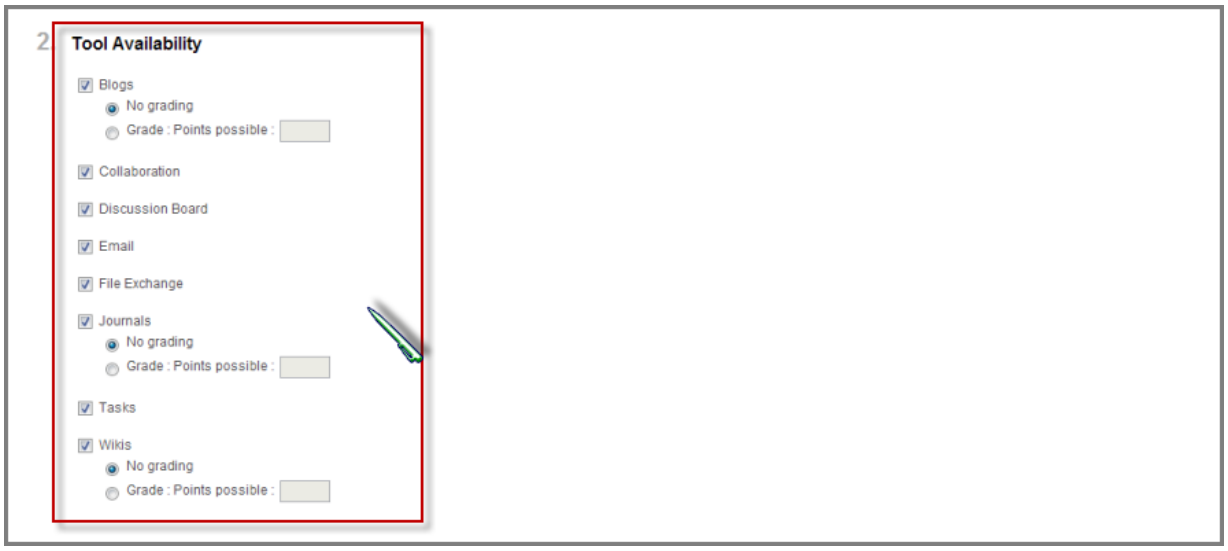
To create groups, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

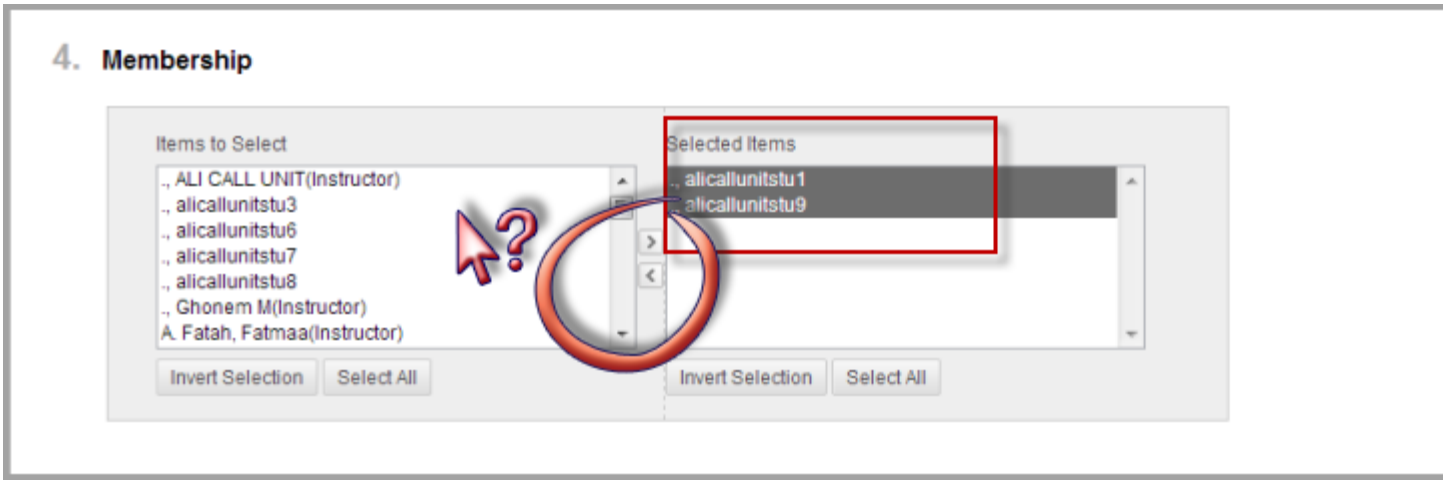
- Click on "**Groups**" as shown below:



- Click on "**Create Single Group**" then "**Manual Enroll**".



- Click on the check boxes next to the tools you want to add for the group. "**Will only be seen by this group**"



- Select desired students from the left box and move them to the second box by clicking on the arrows.
- Press "**Submit**" to save the process.
- Groups appears as follows:

28- **How to create a glossary:**

Remember:

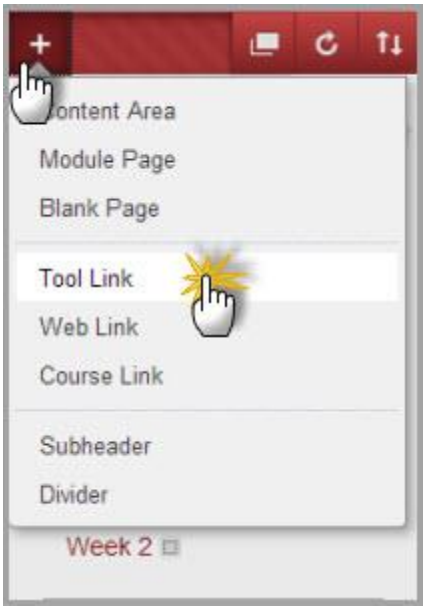
Tool Links are created in order to create links in the menu to the tools embedded in blackboard.

To create a Glossary as a link in the left menu, follow these steps:

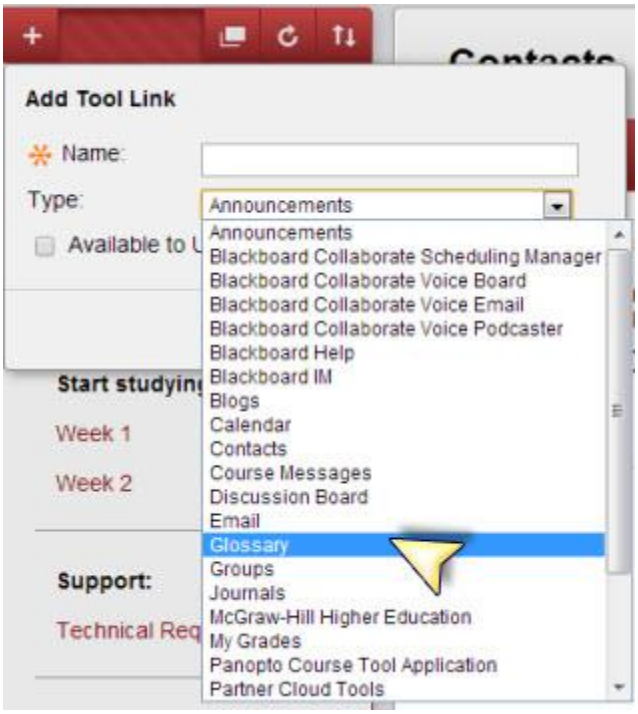
- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

First Step

- Click on the plus sign as shown below:



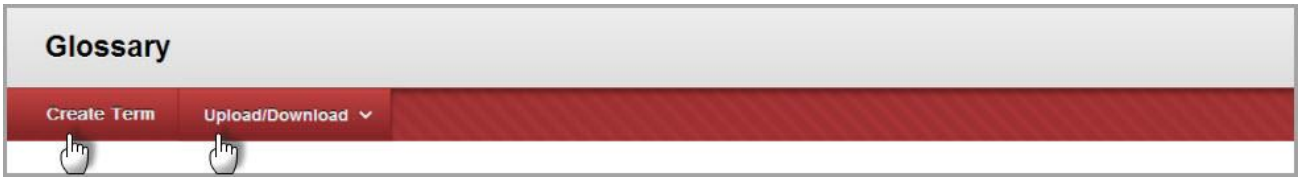
- Click on "**Tool Link**" and a window appears as follows:



- Insert desired name that appears in the menu in the Name text field.
- Click on the drop down menu and select "**Glossary**".
- Click on the check box next to "**Available to users**" in order to visible to students.

Second Step

- Double Click on the link after being added to the left menu and a page will appear as follows:



- Click on "**Create Term**" in order to start creating all desired terms in the course.
- Click on "**Upload Document**" in order to upload a document with certain specifications for creating the terms.

29- **How to create a voice email:**

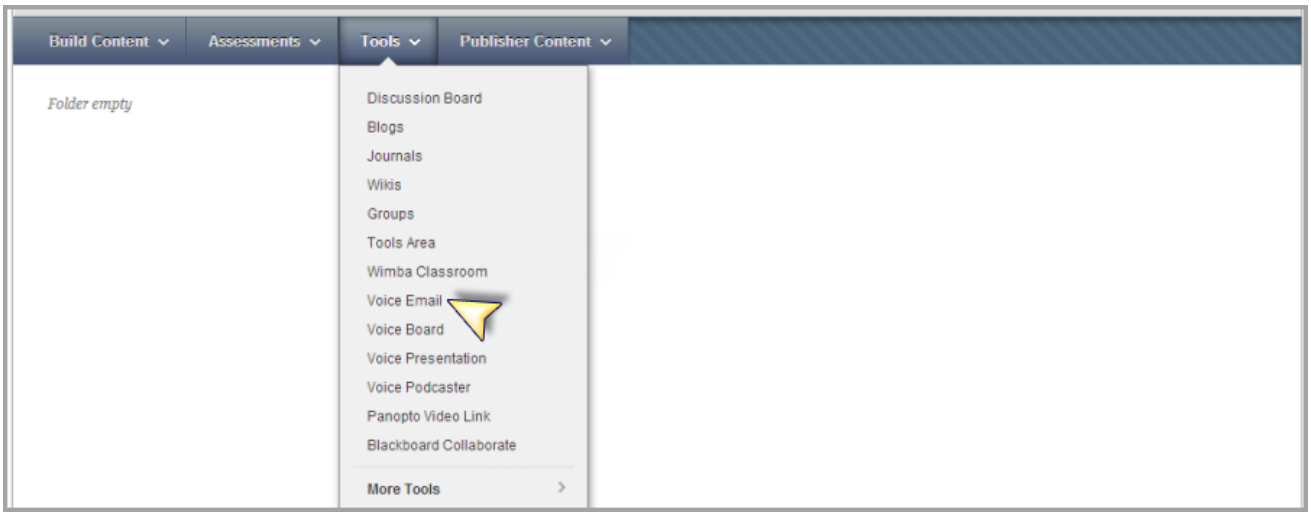
Remember:

Tool Links are created in order to create links in the menu to the tools embedded in blackboard.

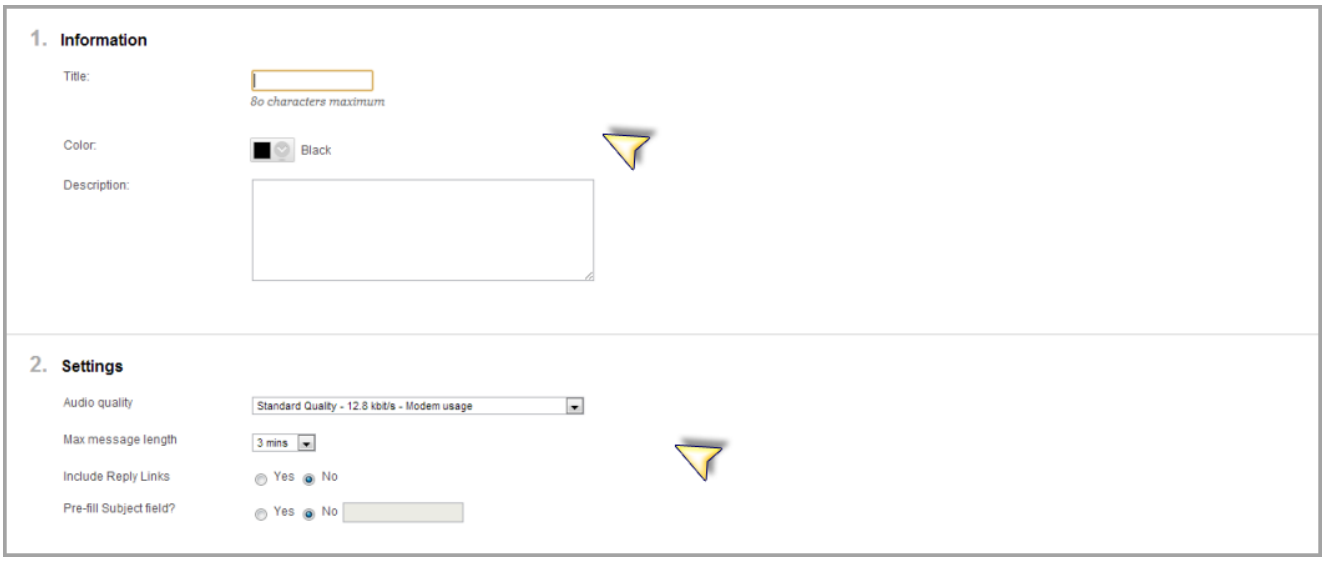
To create a Voice email link in the left menu for sending students voice messages, follow these steps:

- **Note:** Edit Mode must be "**ON**": (Edit mode is **ON** means that you can edit in your pages because it is the instructor view. Edit mode is **Off** means that this is the student view and you can't edit the pages)

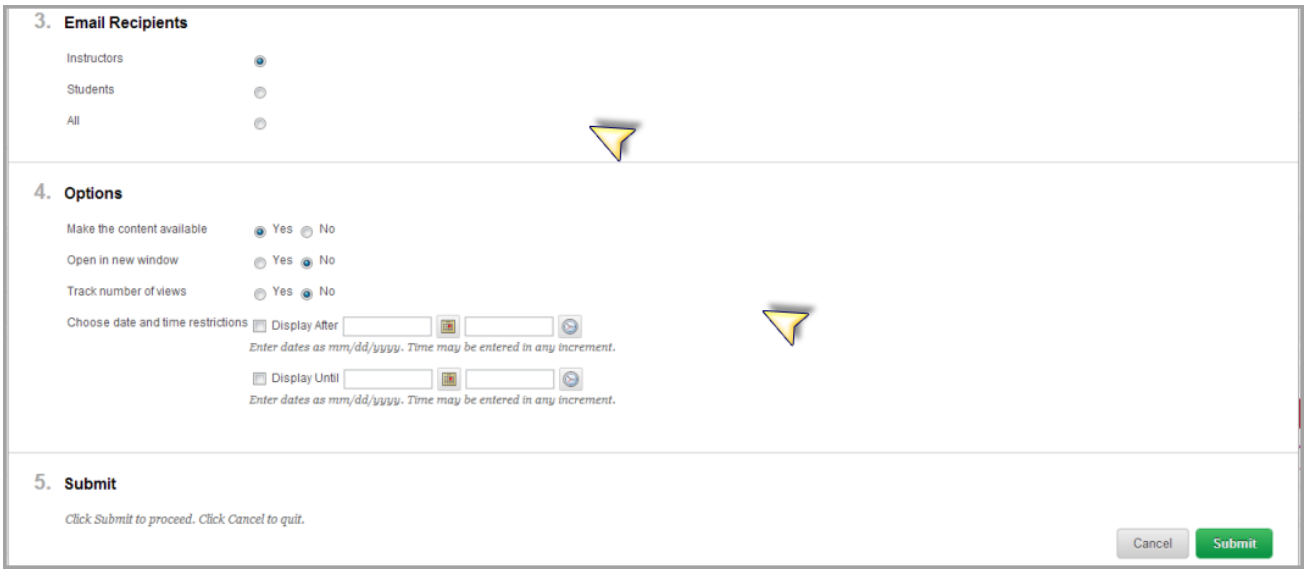
- Reminder: Go to Course Content
- First: Click on "**Tools**"
- Second: Click on "**Voice Email**"



- A page appears as follows:



- Specify voice settings from the above part.

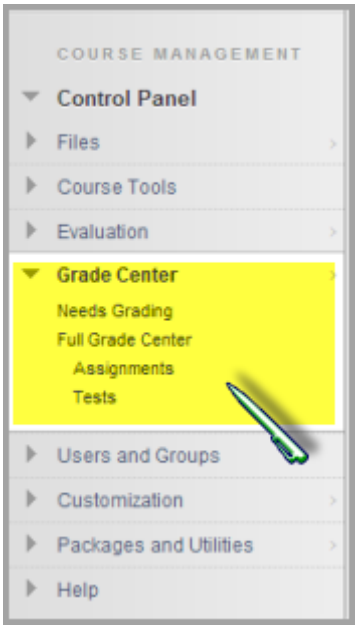


- Specify e-mail recipients and e-mail options from the above part, then press "**Submit**" to save the changes.

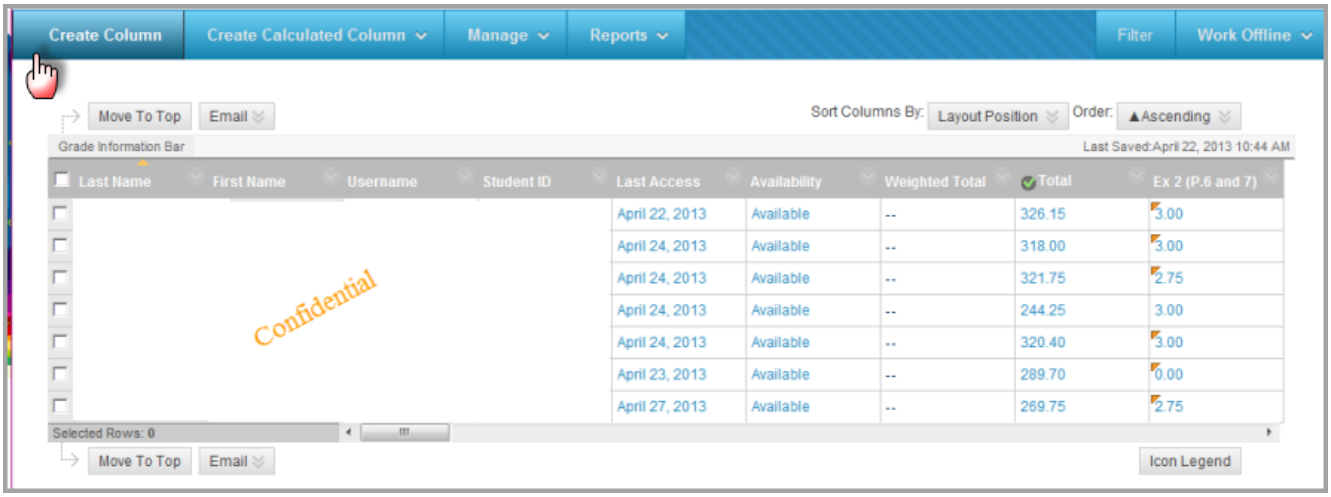
30- **How to manage grade center:**

To manage students' grades, follow these steps:

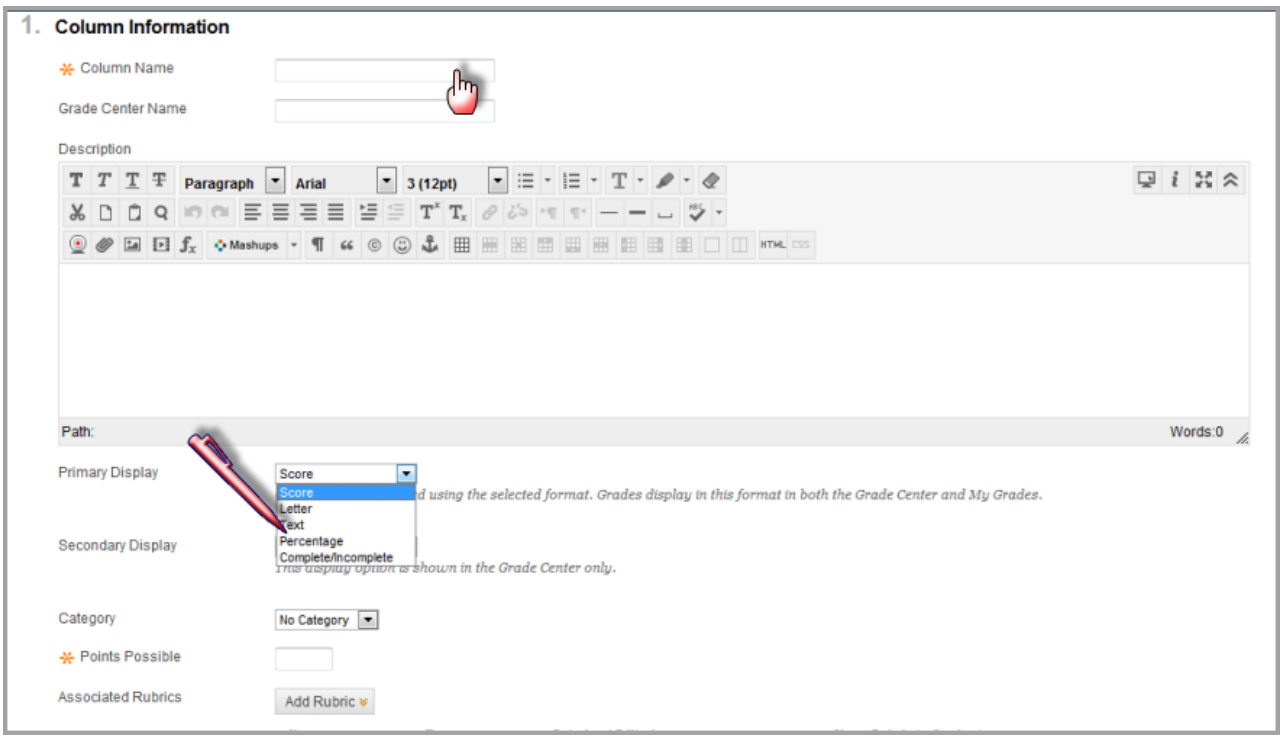
- First: Click on "**Grade Center**" then click on "**Full Grade Center**" as shown below:



- A page appears as follows:

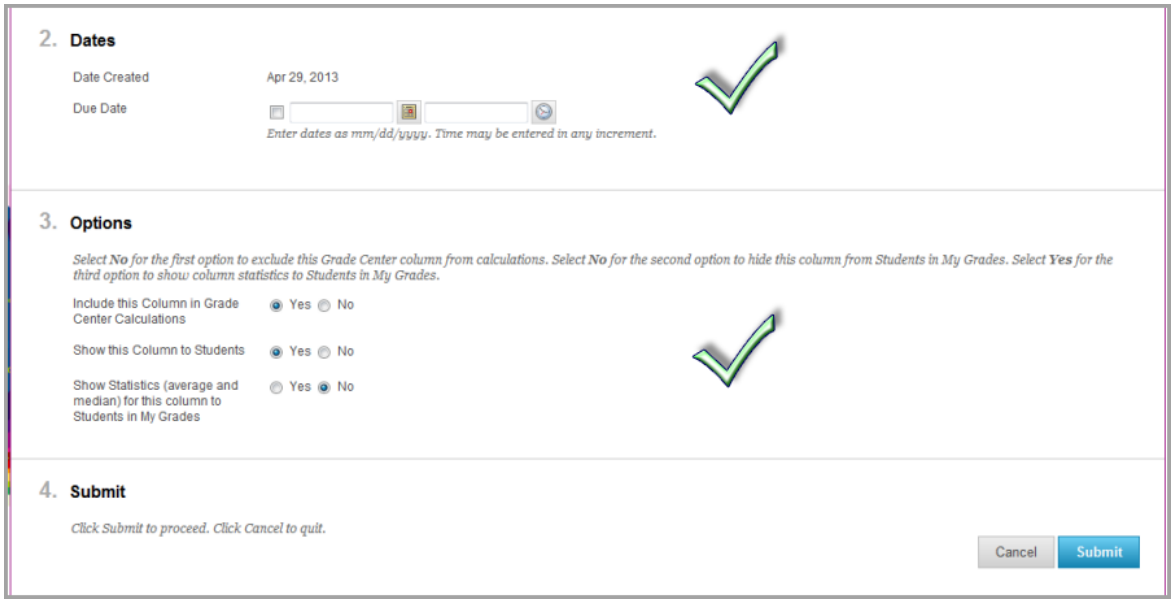


- Click on the assignment that you want to grade and a page appears as follows:



- Insert column details as shown in the above image.
- Specify grade display from the above drop down menu.
- Click on "**Category**" to view the following drop down menu:

- Select desired category from the drop down menu.

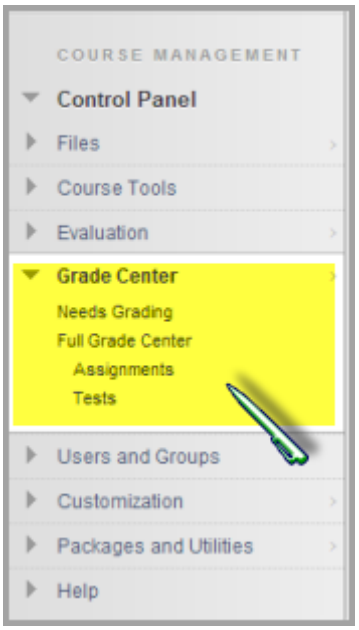


- Specify Grade options as shown in the above image.
- Press "**Submit**".

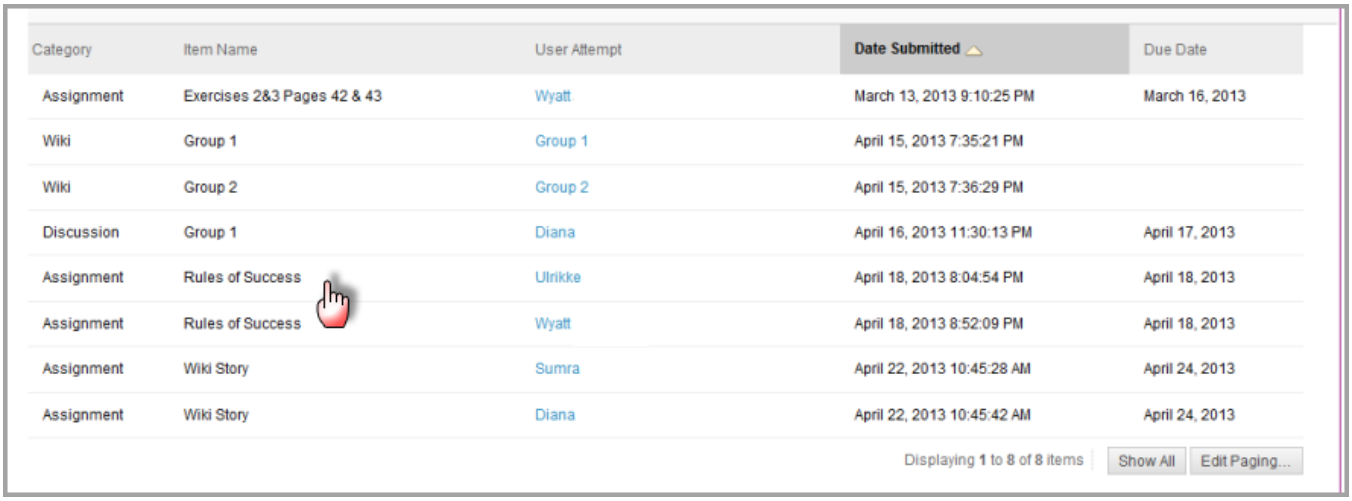
31- **How to grade an assignment:**

To give a grade, follow these steps:

- First: Click on "**Grade Center**" then click on "**Needs Grading**" as shown below:



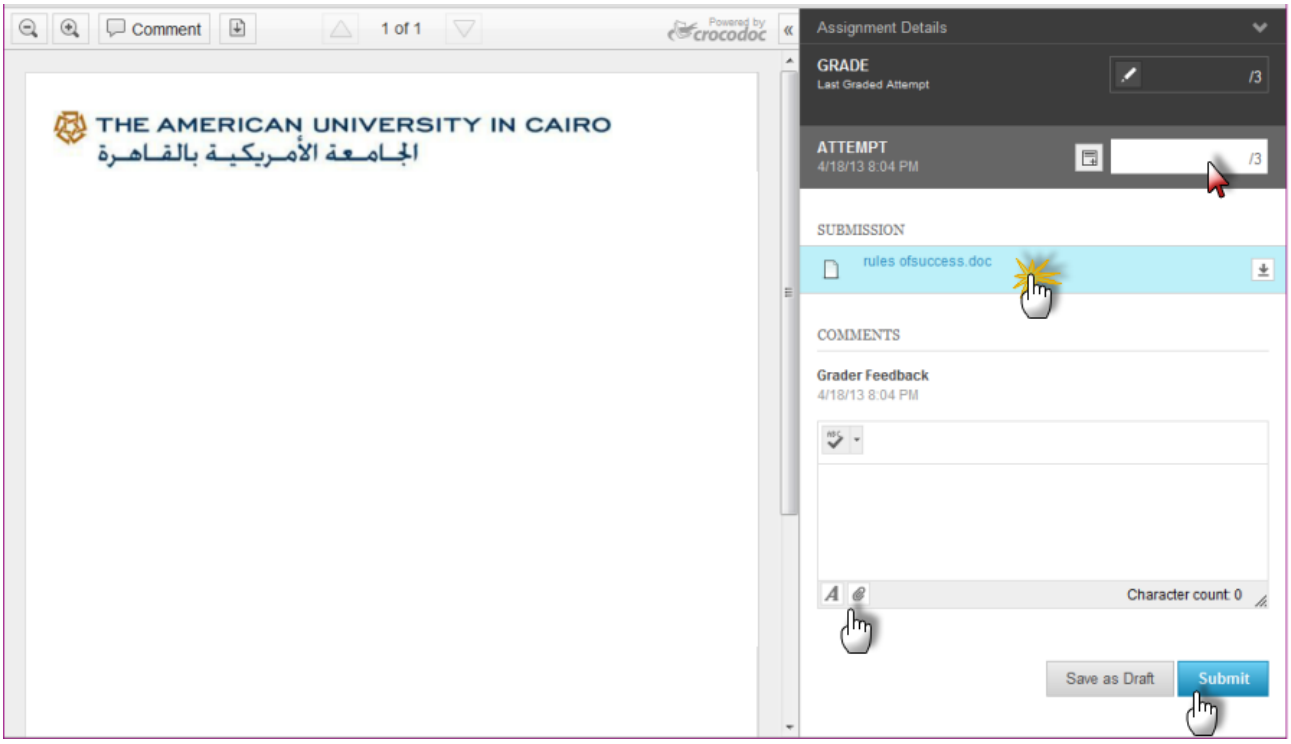
- A page appears as follows:



Category	Item Name	User Attempt	Date Submitted	Due Date
Assignment	Exercises 2&3 Pages 42 & 43	Wyatt	March 13, 2013 9:10:25 PM	March 16, 2013
Wiki	Group 1	Group 1	April 15, 2013 7:35:21 PM	
Wiki	Group 2	Group 2	April 15, 2013 7:36:29 PM	
Discussion	Group 1	Diana	April 16, 2013 11:30:13 PM	April 17, 2013
Assignment	Rules of Success	Ulrikke	April 18, 2013 8:04:54 PM	April 18, 2013
Assignment	Rules of Success	Wyatt	April 18, 2013 8:52:09 PM	April 18, 2013
Assignment	Wiki Story	Sumra	April 22, 2013 10:45:28 AM	April 24, 2013
Assignment	Wiki Story	Diana	April 22, 2013 10:45:42 AM	April 24, 2013

Displaying 1 to 8 of 8 items | Show All | Edit Paging...

- Click on the assignment that you want to grade and a page appears as follows:

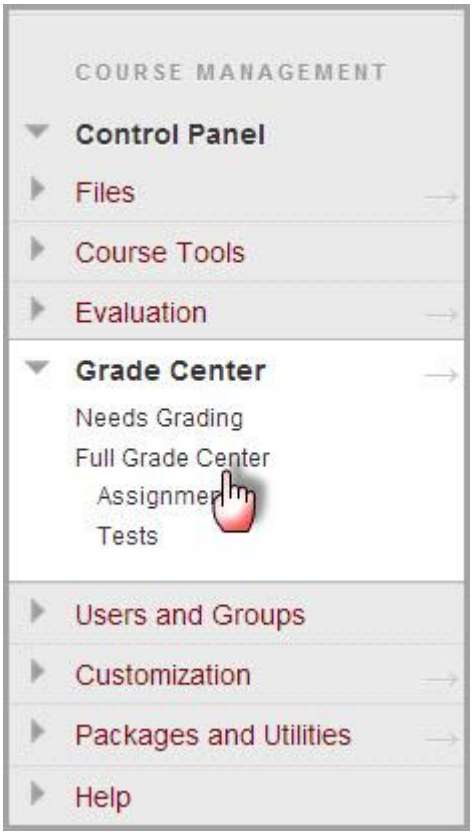


- Download the sent file then correct it.
- Upload corrected assignment.
- Insert student's grade.
- Press "**Submit**".

32- **How to change the letter schema:**

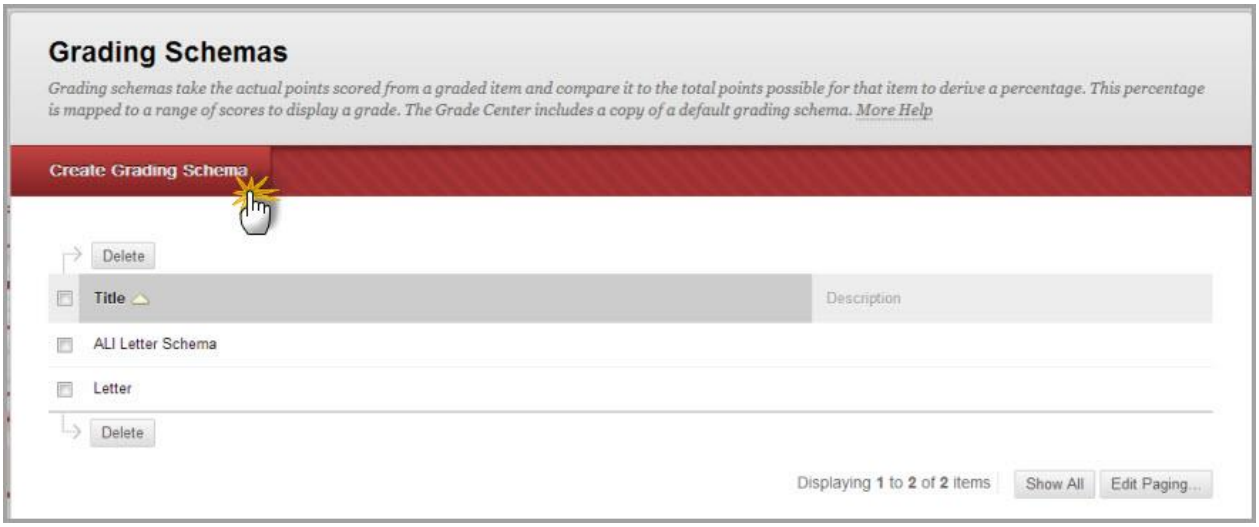
To change the Letter Schema, follow these steps:

- First: Click on "**Grade Center**" then click on "**Full Grade Center**" as shown below:

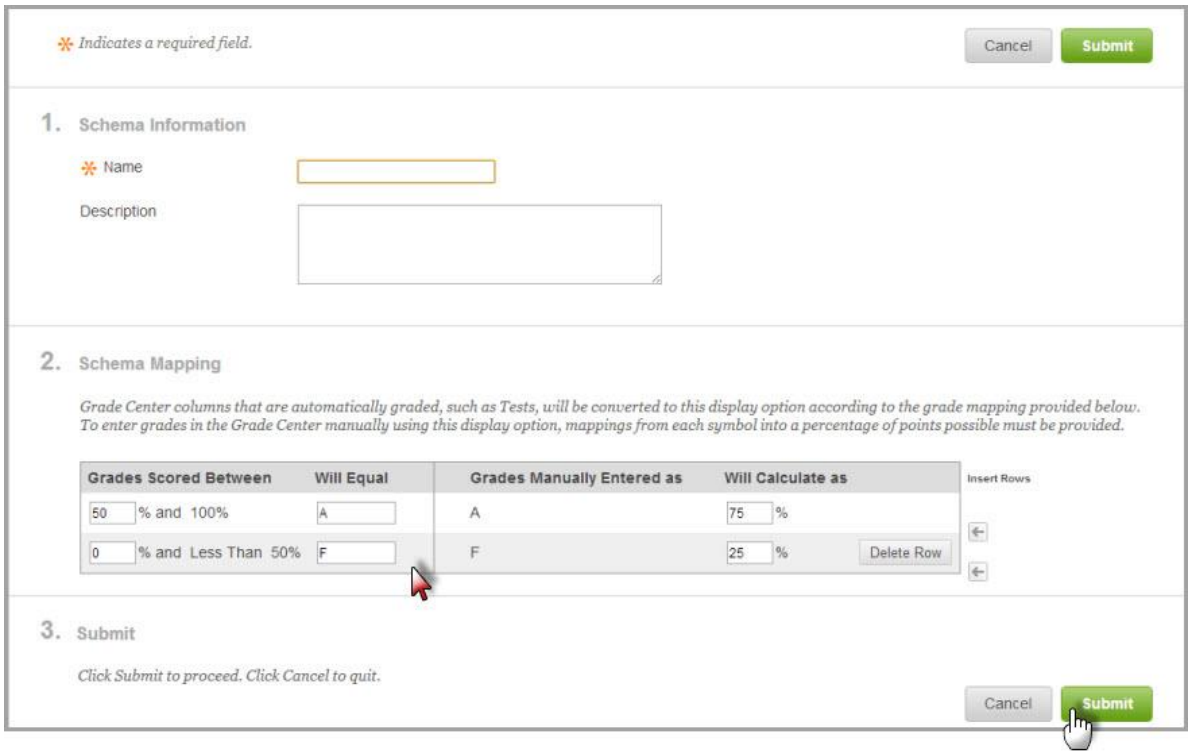


- A page appears as follows:

- Click on "**Manage**" then click on "**Grading Schemas**" and another page will appear as follows:



- Click on "**Create Grading Schema**" in order to create a new schema different than the default one used by blackboard.



- Fill in the above schema details then click "**Submit**" to save the new created schema.

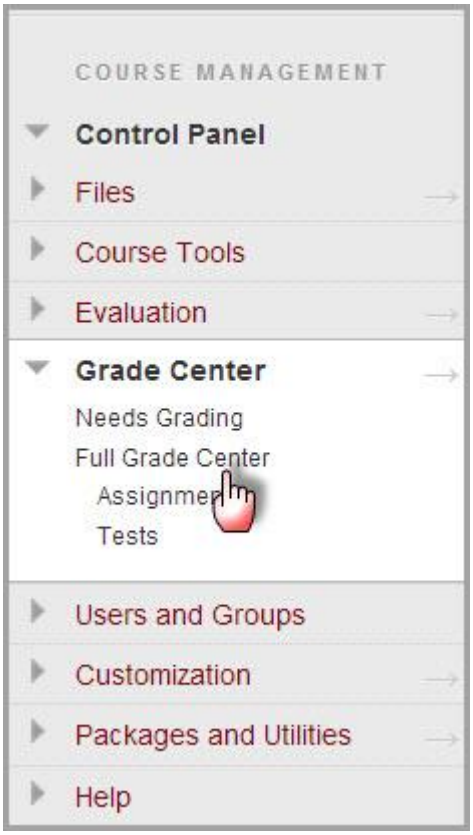
Note:

In grading, do not forget to use the new created schema, or else you will be using the default schema used by blackboard.

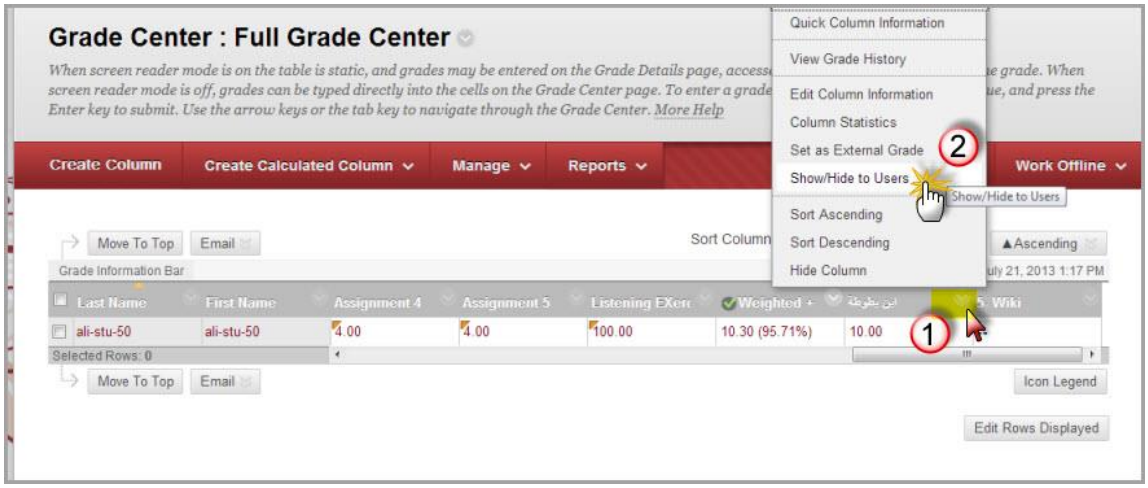
33- **How to hide a grade from students:**

To hide a grade from your students, follow these steps:

- First: Click on "**Grade Center**" then click on "**Full Grade Center**" as shown below:



- A page appears as follows:



- Click on the "**down arrow**" next to the column you want to hide.
- A menu appears as shown above. Click on "**Show/Hide to Users**"

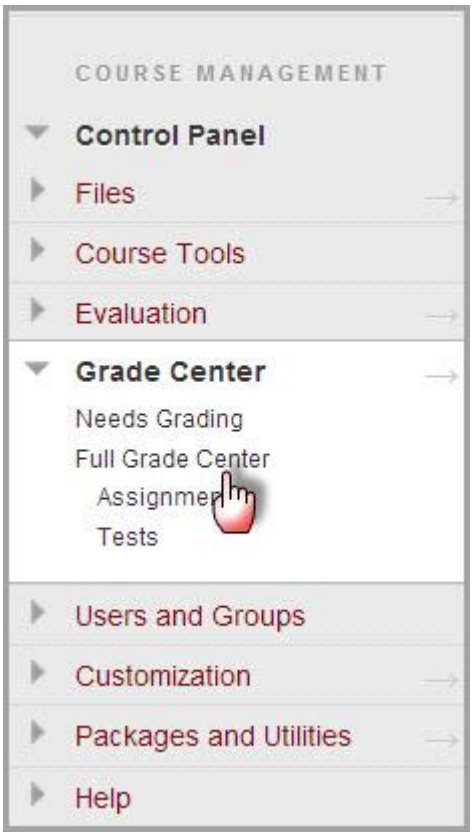
34- **How to create a new column in the grade center:**

Note:

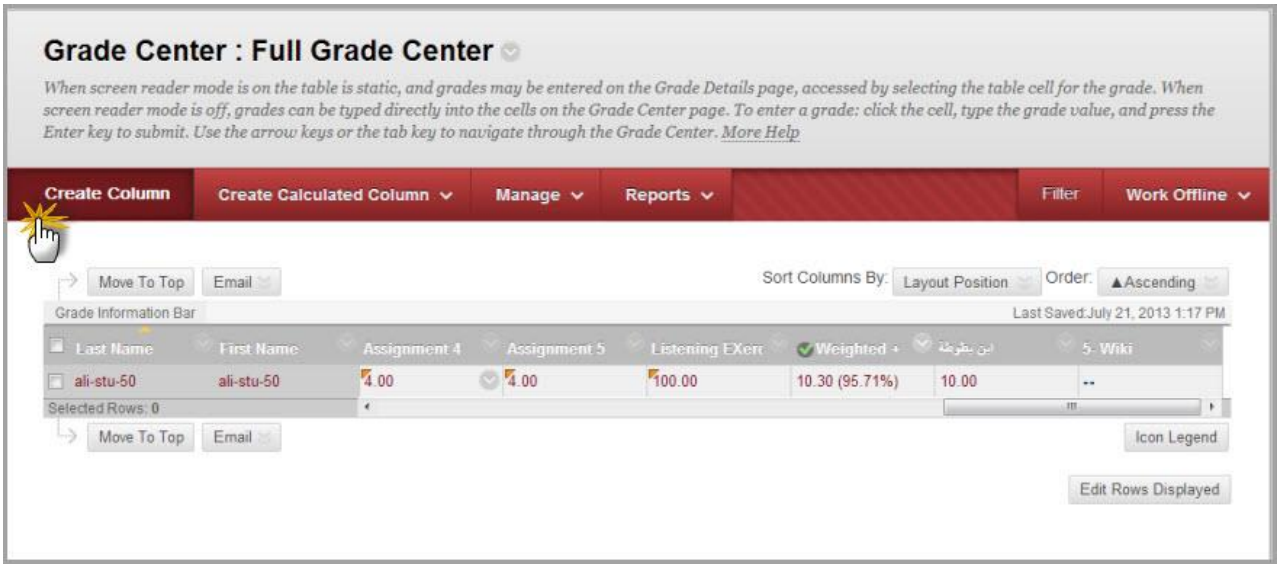
You can create a standalone column aside from the ones created automatically by blackboard.

To create a new column in the grade center, follow these steps:

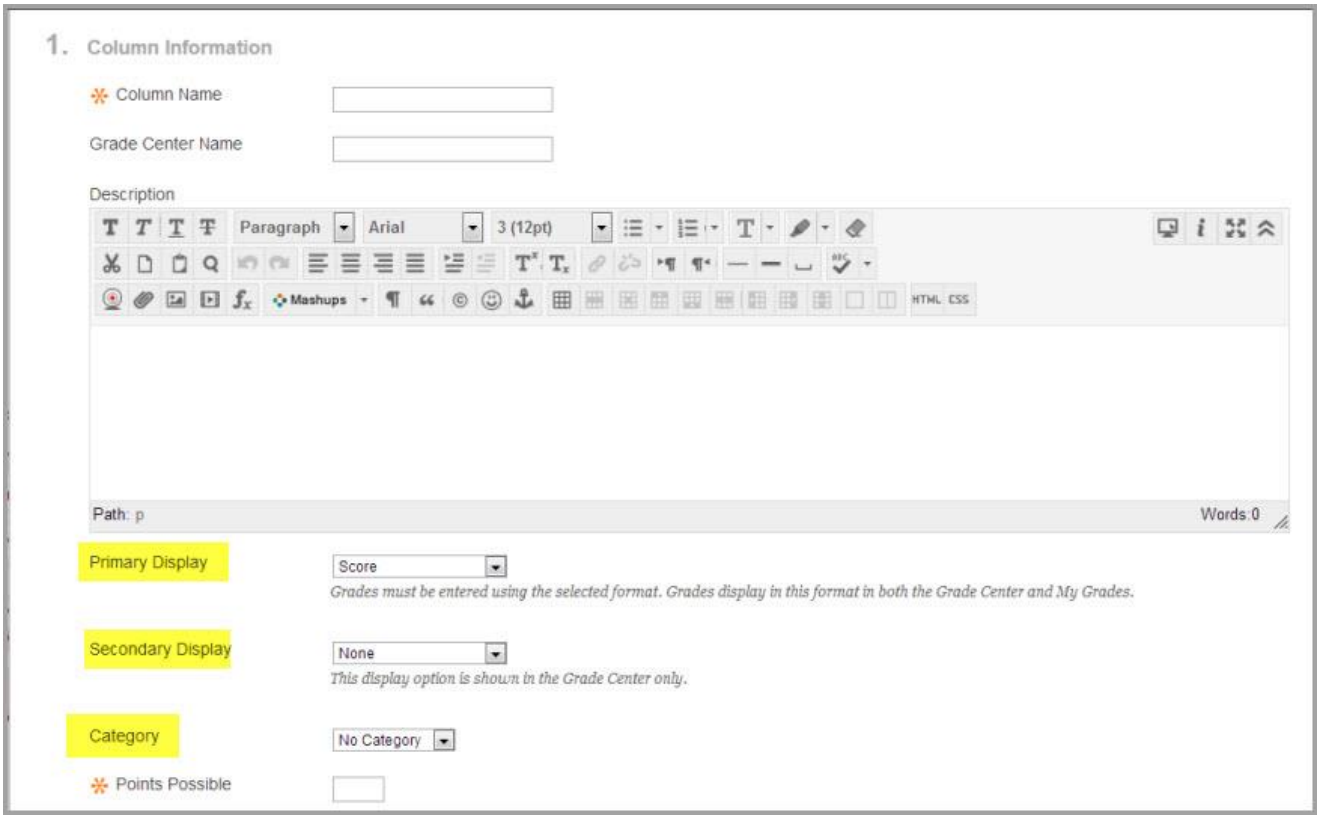
- First: Click on "**Grade Center**" then click on "**Full Grade Center**" as shown below:

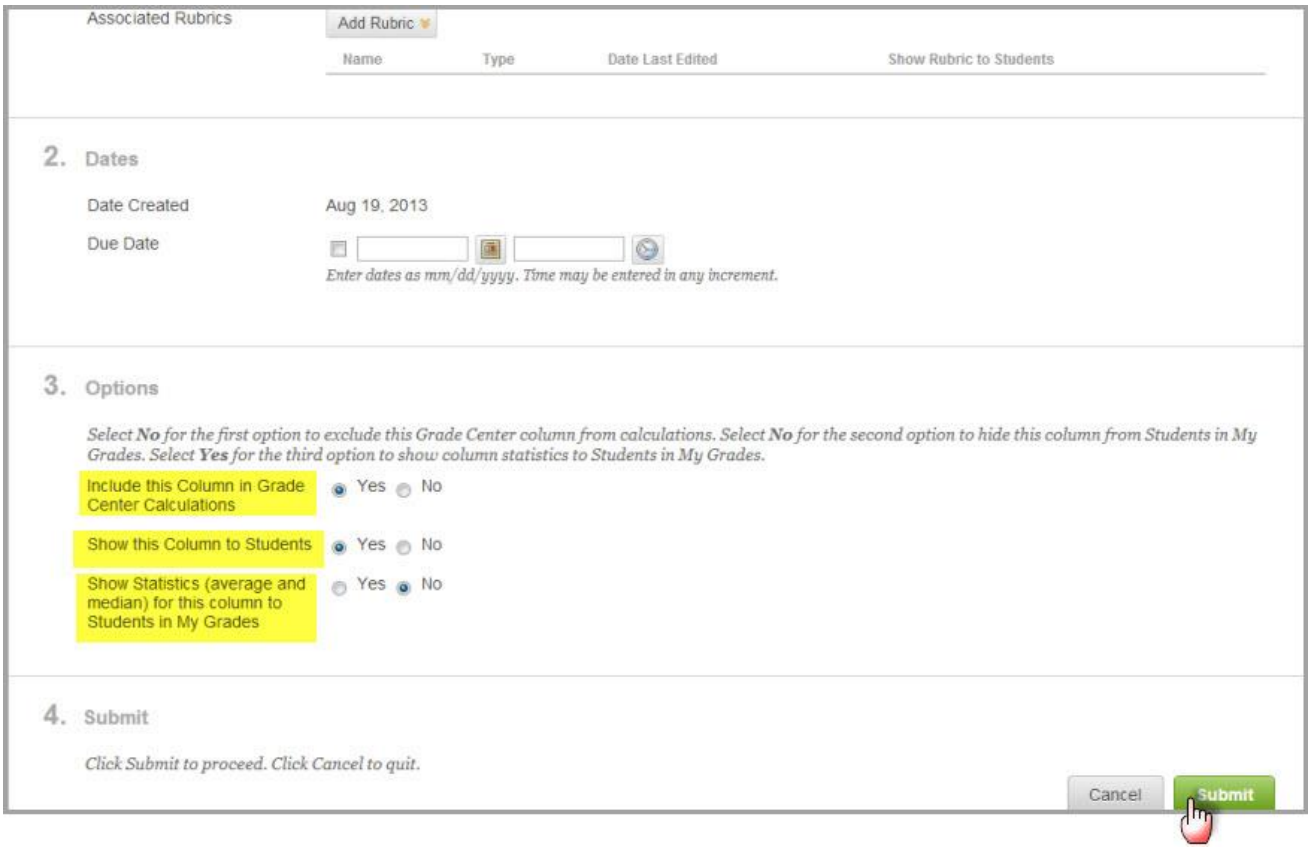


- A page appears as follows:



- Click on "**Create Column**" and another page appears as follows:



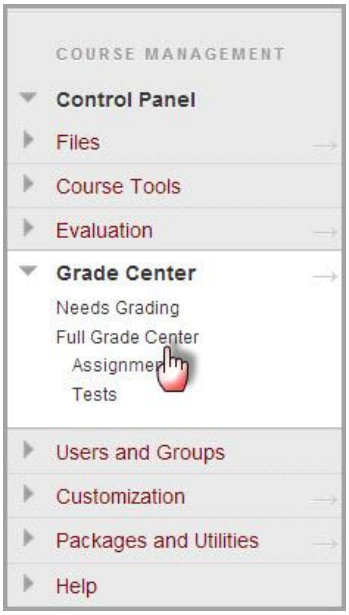


- Press "**Submit**" in order to save the created column.

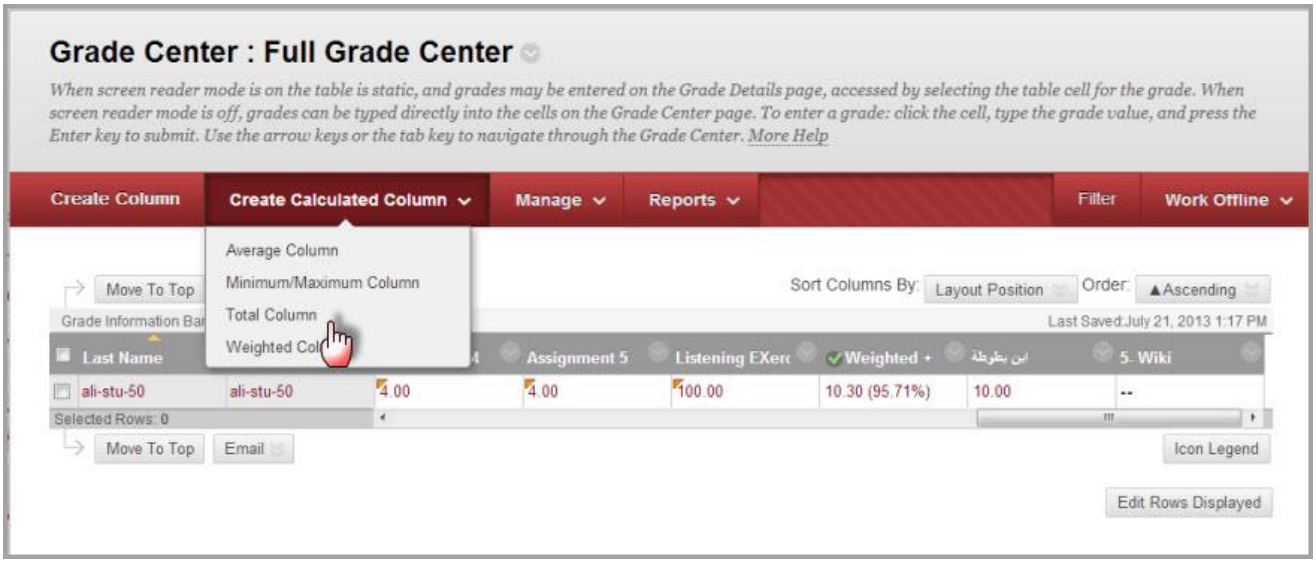
35- **How to add total grade:**

To add the total grades in one column, follow these steps:

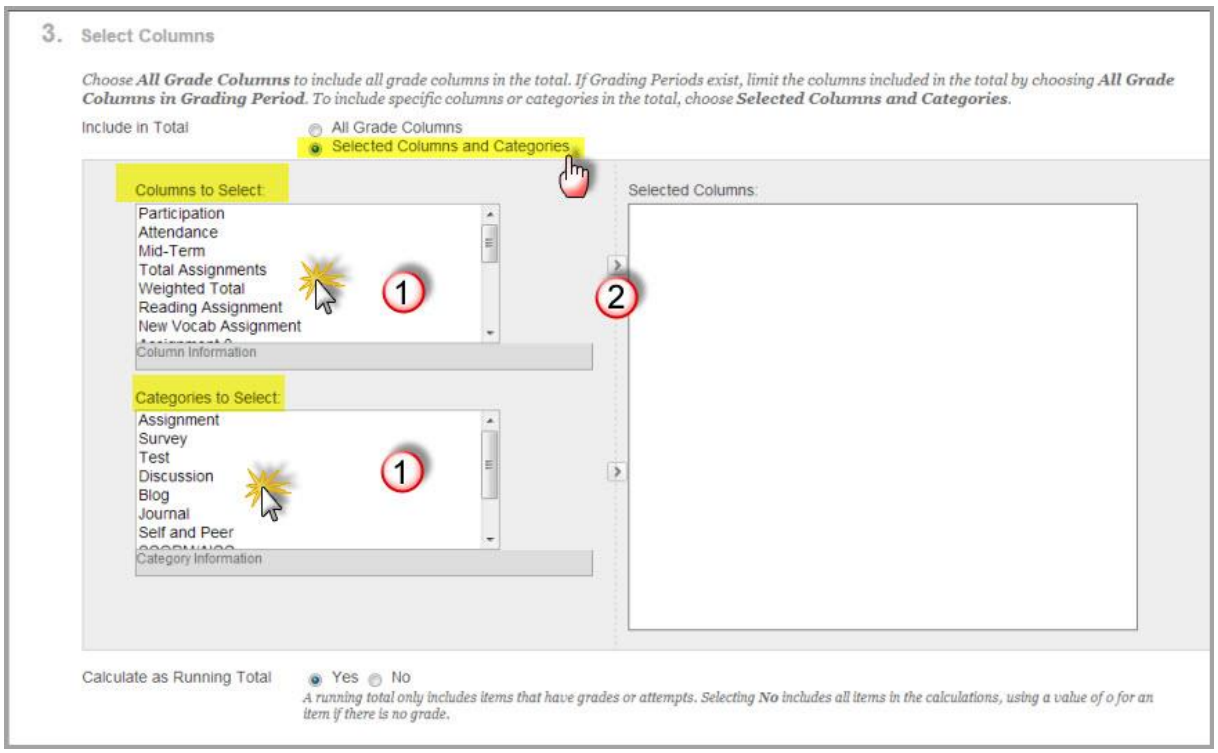
- First: Click on "**Grade Center**" then click on "**Full Grade Center**" as shown below:



- A page appears as follows:



- Click on "**Create Calculated Column**" then click on "**Total Column**".



- Click on the **column** or **category** that you want to add as shown and a page will appear as follows:

Note:

What is the difference between "**Column**" and "**Category**"?

- **Column**: It is either a column that you created or a column that **Blackboard** created.
- **Category**: All columns that belong to a certain category such as: Assignments, Wikis, Discussion boards,... etc. Accordingly, any column that belong to any type of these categories, will be added automatically to the total column once you select them.

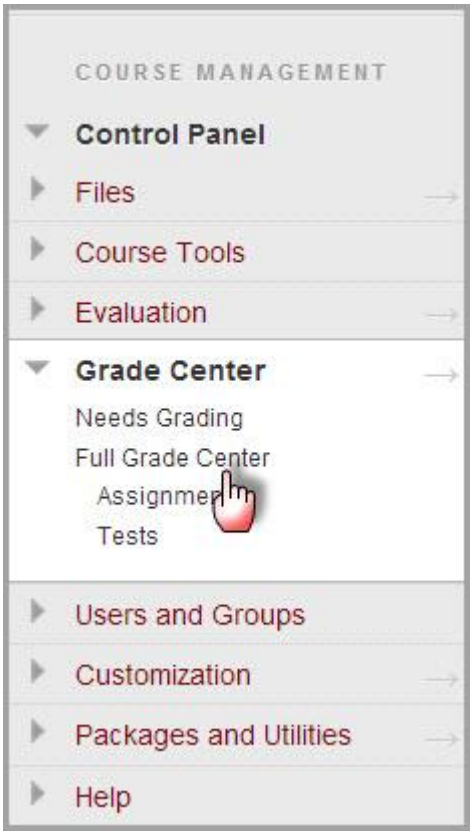
36- **How to create weighted total:**

Note:

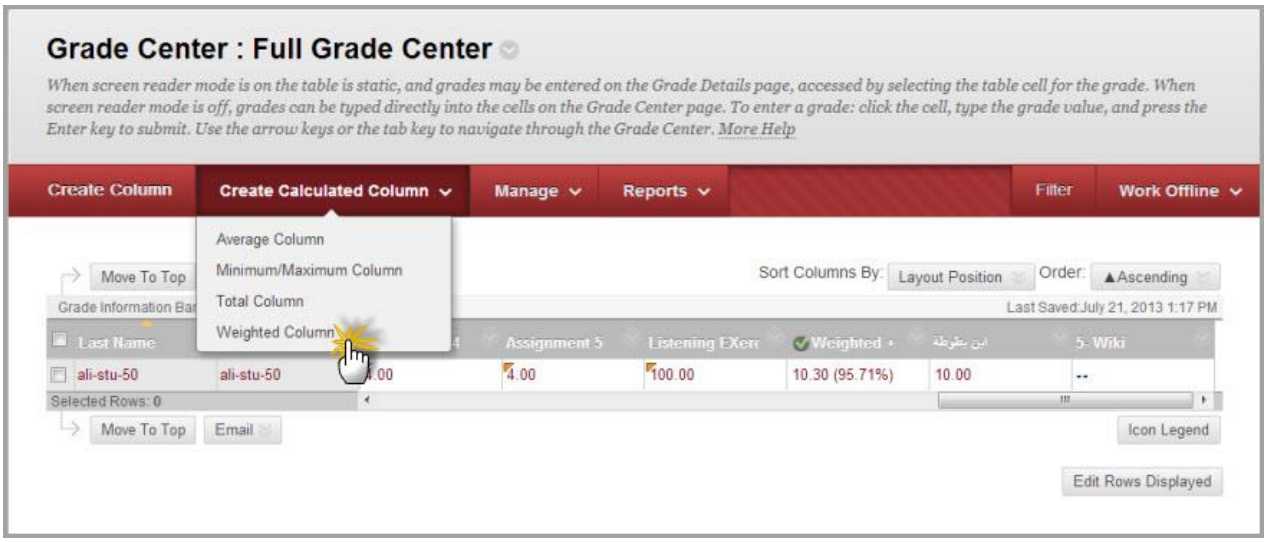
We create "**Weighted Total**" in order to save our effort and have an automatically calculated grade at the end of the semester for each students. Accordingly, no more paper work and no more excel sheets.

To create a Weighted Total, follow these steps:

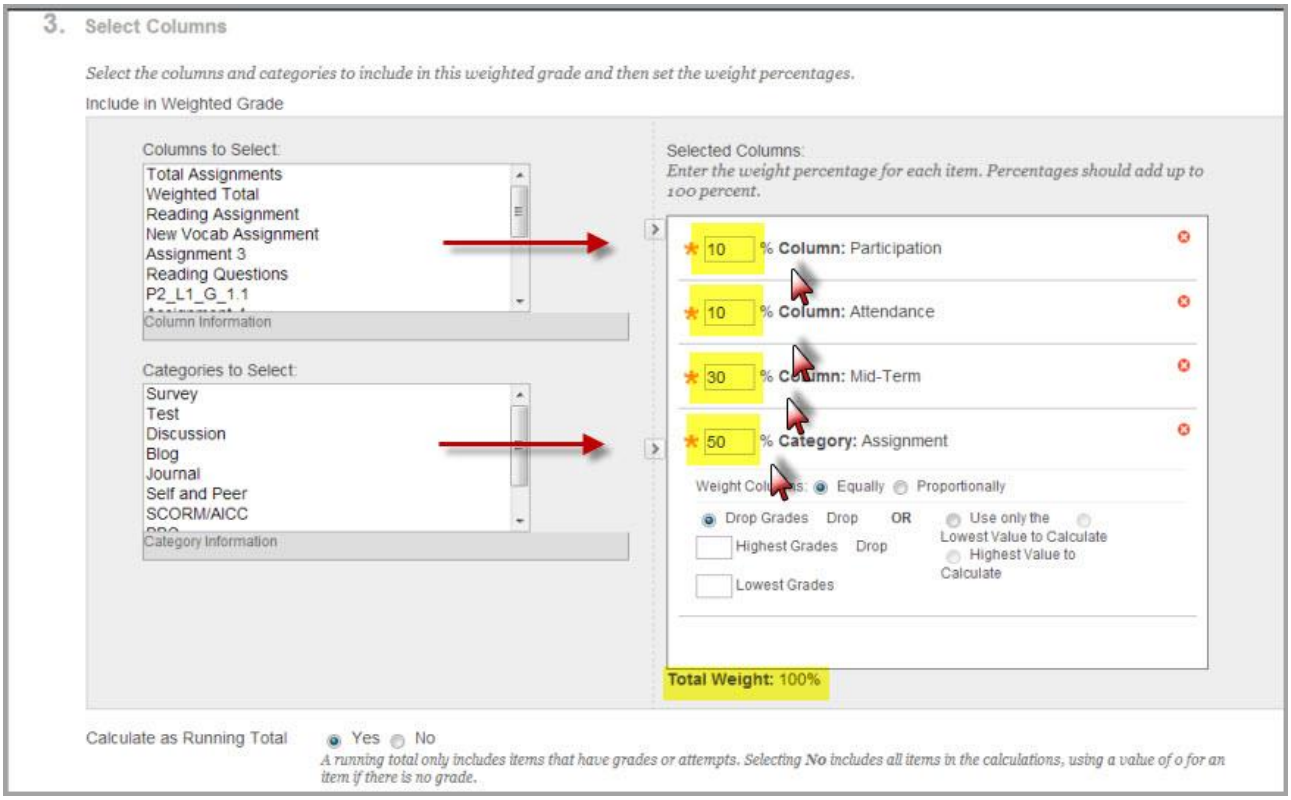
- First: Click on "**Grade Center**" then click on "**Full Grade Center**" as shown below:



- A page appears as follows:



- Click on "**Create Calculated Column**" then click on "**Weighted Column**" and another page will appear as follows:

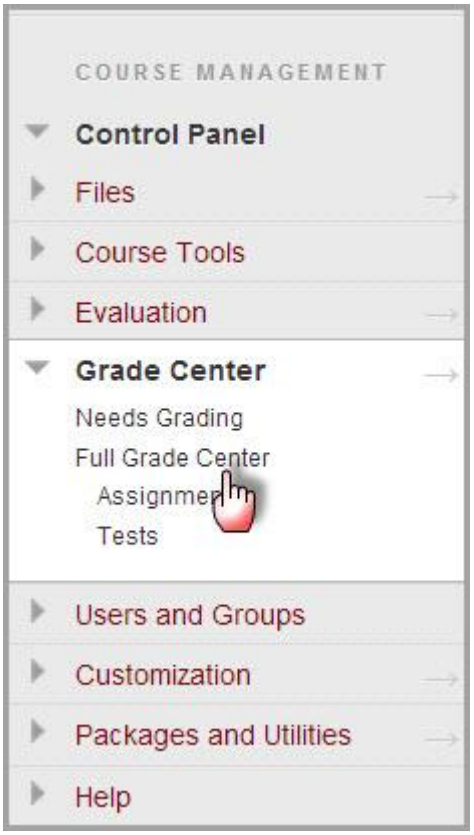


- Insert the weight of each column in the above text fields. The total weight of all columns should be 100%

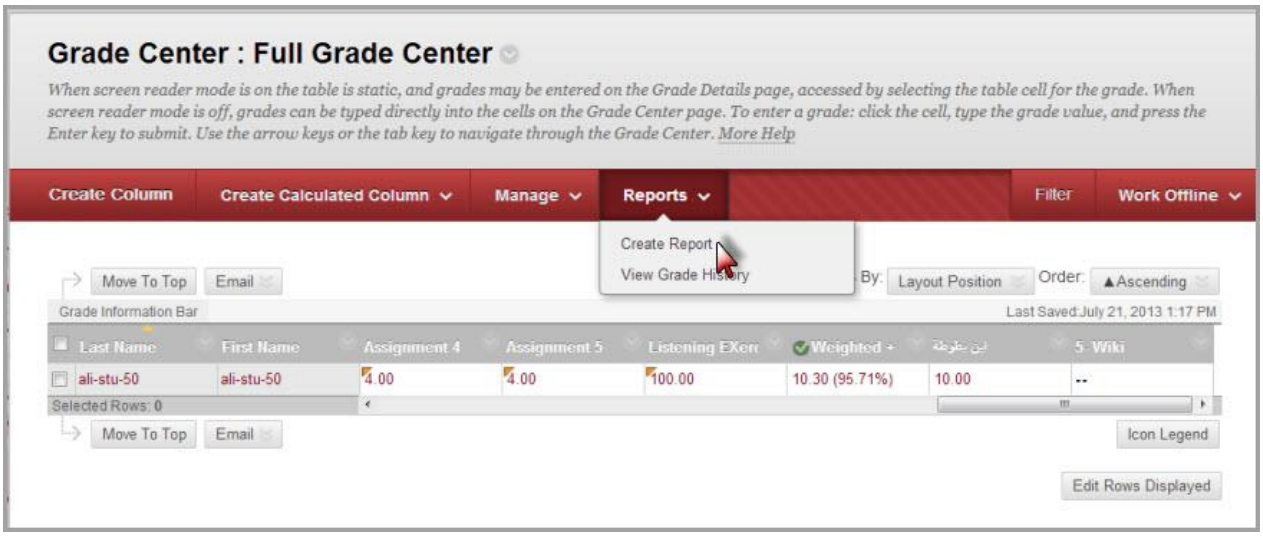
37- **How to generate a grade report:**

To generate a Grade Report, follow these steps:

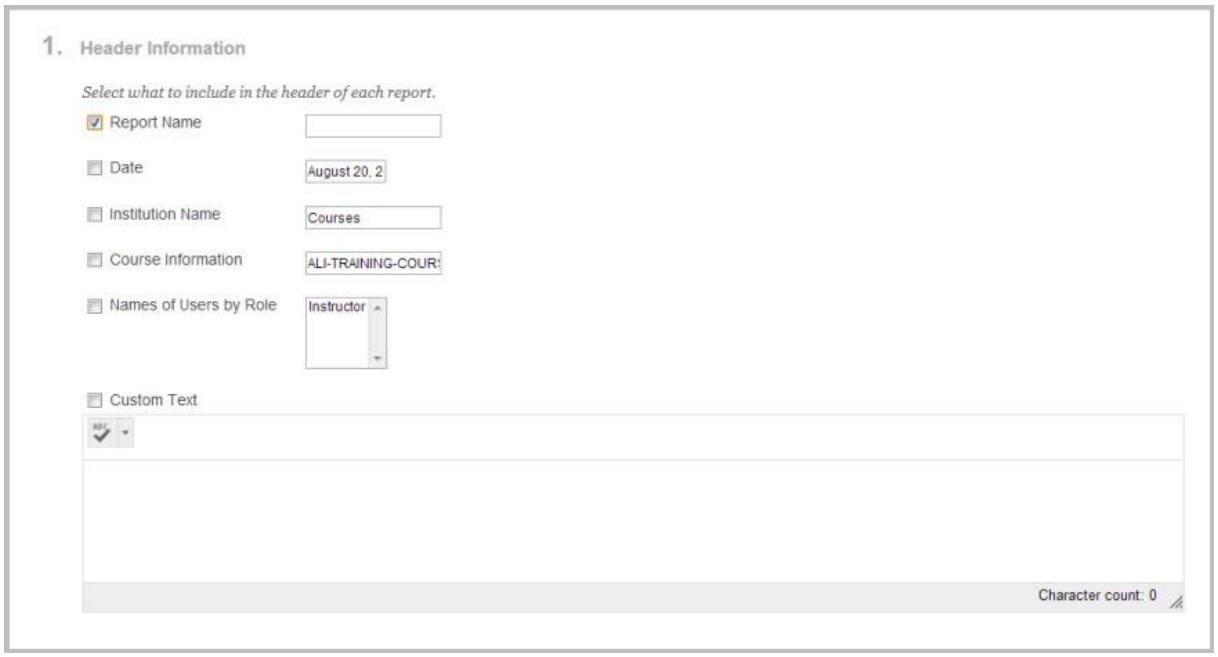
- First: Click on "**Grade Center**" then click on "**Full Grade Center**" as shown below:

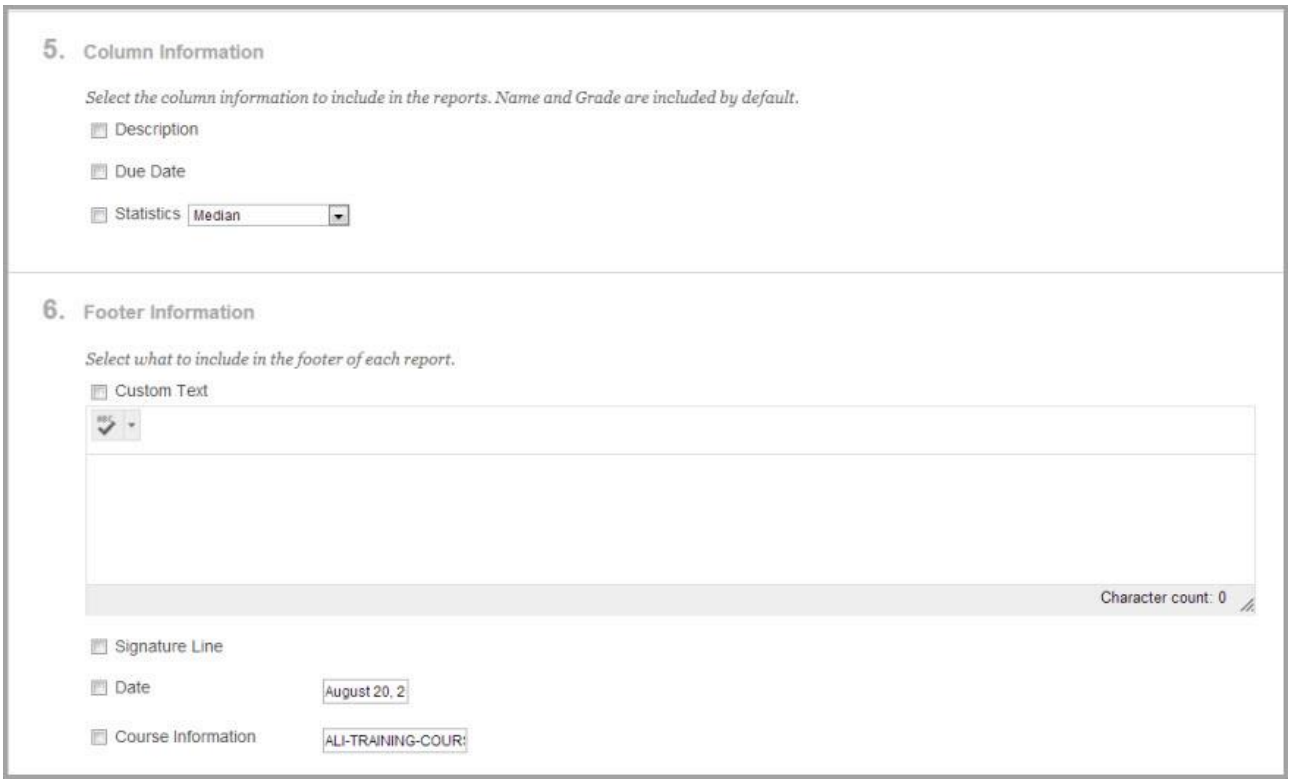


- A page appears as follows:



- Click on "**Reports**" then click on "**Create Report**" and another page will appear as follows:





- Fill in the desired details and then press "**Submit**" to view the report.