Use of E-Learning functionalities: results of a survey along Spain

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Abstract— **This paper shows the results of a survey performed in Spain about the different functionalities of e-learning platforms. This survey was filled in by a group of teachers, experts in Engineering Education along all Spain, through the Spanish Chapter of the IEEE Education Society. The paper shows the opinion on several aspects about the e-learning functionalities, such as knowledge level, usage level, usefulness, etc., as well as the most used platforms. One of the objectives of this work is to create a reflexive debate in the international community about the e-Learning platform use.**

Keywords-component: e-learning platforms, e-learning functionalities

I. INTRODUCTION

During the last years E-Learning platforms (Learning Management Systems) have been a new component that have increased their use in Higher Education (as well as in small, middle and large companies) and proliferate in number in the learning applications scenario. The Engineering Education domain has been aware of this tendency and their application in on-line, distance and traditional university education.

An e-learning platform is a software application installed in a web server, which is used to administer, distribute, and supervise the educational activities of an organization or institution. Its main functions are to manage users, resources, and educational materials and activities, to control the access, to supervise the learning process and progress, to make evaluations, etc.

This year 2009, a survey [1] about different aspects on the use of e-learning platforms in the Engineering Education was filled out by the CESEI (acronym in Spanish of the IEEE-ES-Spanish Chapter) group [2]. This group is promoted by the IEEE-ES Spanish Chapter [3] and currently is composed by more than a hundred teachers of 40 universities along Spain, all of them deeply related with the Engineering Education.

This paper shows the most used e-learning platforms in Spain, the main functionalities of e-learning platforms, and the results of a survey about several aspects on these main functionalities, such as (i) Knowledge Level, (ii) Training, (iii) Usage, (iv) Perception of training proficiency, (v) Usefulness, and (vi) Preparation Effort.

Finally, the paper ends with some conclusions and reflections about the results, and the future actions that could be made.

II. E-LEARNING PLATFORMS AND FUNCTIONALITIES

The first group of e-learning platforms considered for the survey were Moodle [4], Ilias[5], Dokeos [6], .LRN [7], Sakai [8], Claroline [9] and WebCT/ Blackboard [10]. They were selected according to previous studies, such as [11] and a previous reduced survey on a selected group of users.

The questions on the survey were focused on the usage level of each e-learning platform on each university grade, and on the presential or on-line characteristic of its usage.

With respect to functionalities, they were selected mainly from the Edutools Site [12], works [13][14] and the analysis of functionalities of the previous e-learning platforms.

As a consequence, the following functionalities were selected:

- Content Delivery: It is the most usual functionality, and permits to deliver contents to students.
- e-mail: Internal email is electronic mail that can be read or sent from inside an online course.
- Tasks-Exercises: They usually consist of some kind of material that students have to upload to platform in response to some required activity.
- Forums: Discussion forum is a threaded online text conversation between participants.
- Mailing lists: They allow to send mails to different users in a joint fashion.
- Exams: the typical exams to evaluate the work of students.
- Self-assessment: This kind of tools enables students to assess his/her progress and knowledge level on a specific subject.
- Surveys: This functionality enables the possibility of perform surveys to students on different topics.
- Groupwork: Group Work is the capacity to organize a class into groups and provide group work space that enables the instructor to assign specific tasks or projects.

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- Chat: Real-time chat is a conversation between people over the Internet that involves exchanging messages back and forth at virtually the same time.
- Calendar: it enables students to document their plans for a course and the associated assignments in a course.
- FAQs: It is the typical Frequented Asked Questions service.
- Wikis: It is a service that allows the easy creation and editing of any number of web pages, using a simplified text editor.
- Blogs: A blog (a contraction of the term "web log") is a type of functionality that permits an individual to show regular entries of commentary, descriptions of events, or other material, usually in chronological order.
- Glossaries: This functionality allows a way to present definitions that can be looked up by the students.
- Videoconference: It allows two or more locations to interact via two-way video and audio transmissions simultaneously.
- Notebook: It enables students to make notes in a personal or private book. The personal notes can be shared with another students and/or teachers, but private notes can not be shared.
- Whiteboard: Whiteboard tools include an electronic version of a dry-erase board used by instructors and learners in a virtual classroom (also called a smartboard or electronic whiteboard) and other synchronous services such as application sharing, group browsing, and voice chat.
- Learning Paths. This functionality, also called lessons, allows teacher to add entire lessons that guide the student based on the student's answers. It might be helpful to think of a lesson as a kind of flowchart.
- Student Portfolio: Student Portfolios are areas where students can showcase their work in a course, display their personal photo, and list demographic information.
- Podcast: It is a series of audio files that can be downloaded from the e-learning platforms.
- Student Tracking: Student Tracking is the ability to track the usage of course materials by students, and to perform additional analysis and reporting both of aggregate and individual usage.
- Vodcast: It is a series of video files that can be downloaded from the e-learning platforms.

After a period of reflection and discussion, and based on the experience of the working team, we agreed that the questions about these functionalities were: (i) Knowledge Level, (ii) Training, (iii) Usage, (iv) Perception of training proficiency, (v) Usefulness, and (vi) Preparation Effort. We thought that these topics would help us to understand and improve the use of e-learning platforms in teaching/learning processes.

III. RESULTS

The survey was realized during the last days of May and first days of June, 2009. Finally the survey was completed by 162 teachers, where a 79% was male and a 21% was female. The results shown us that only the 13% of the teachers did not use e-learning platforms, and the rest (87%) did use them.

The characteristics of the teachers can be seen in figures 1, 2 and 3. Figure 1 shows the distribution of teachers according to their age. It can be shown that there practically all ages are represented, and that the most of them are in 36-50 range (63%). Figure 2 shows that the 45% of teachers has more than 20 years of teaching experience, and that more than the 50% has more than 15 years of teaching experience. Finally, figure 3 shows that more than the 60% of teachers who use e-learning platform has at most 5 years of experience in such platforms.

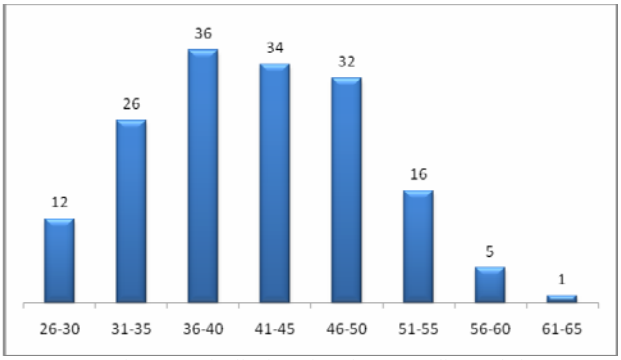

Figure 1. Distribution of teachers according to their age.

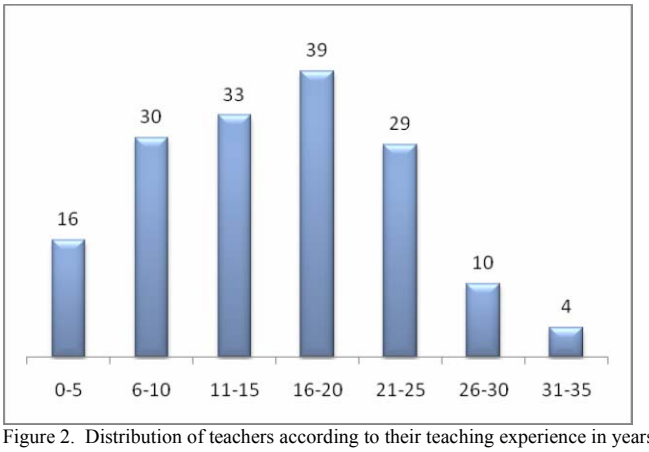

Figure 2. Distribution of teachers according to their teaching experience in years.

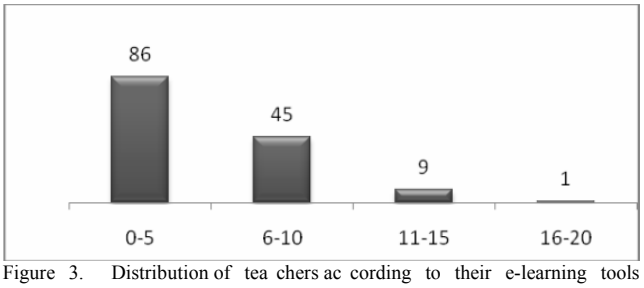

Figure 3. Distribution of teachers according to their e-learning tools experience in years.

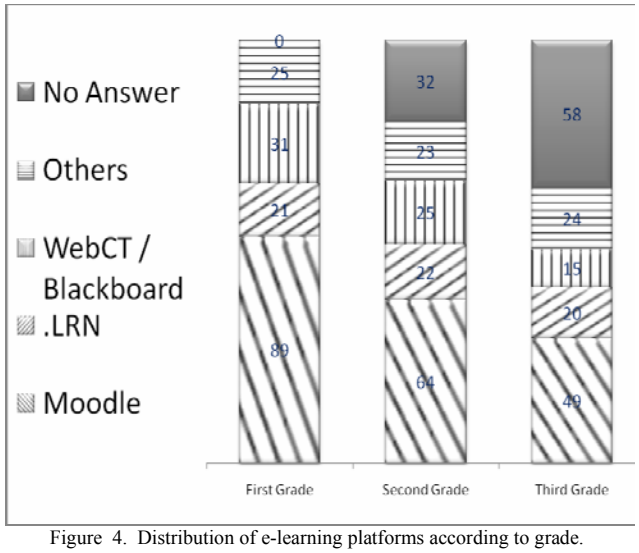

Figure 4. Distribution of e-learning platforms according to grade.

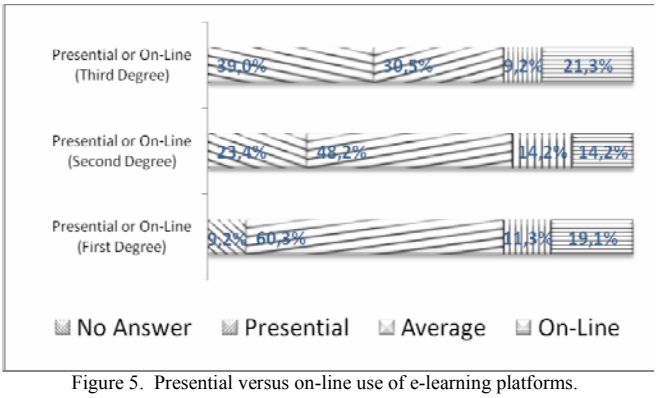

Figure 5. Presential versus on-line use of e-learning platforms.

In the figures 4 and 5 we can see the most used e-learning platforms in Spain according with the university grade (first grade or diplomate studies, second grade or graduate studies and third grade or doctoral studies), and the presential vs. on-line use in each grade. Notice that Moodle [4] is clearly the first used e-learning platform in all grades, and that WebCT [10] and .LRN [7] are both quasi-equal in the second place. Among the others e-learning platforms used in Spain are proper university platforms (6 cases), Aula Global (3), Aula Web (2), ACME (1), eKASI (1), ecampus (1), SIFO (1), ADI (1), SWAD (1), MIT (1), GEN (1) and Drupal (1).

With respect to the use on-line or presential, we can emphasize that the character on-line is between 14% and 21% in the three grades, and the character blended learning (mixture of on-line and presential) is between 9% and 14% in the three grades. However, the character presential significantly decreases with the grade, from the 60,3% in first grade, to 48.2% in second grade and finally to 30,5% in third grade. It is also significant that a greater grade, the greater the teachers who do not answer to this question.

In figures 6, 7, 8, 9, 10 and 11 (last pages of the paper), the results for each one of the topics and functionalities selected in this paper are shown:

i. With respect to the Knowledge Level of these functionalities, we can see that there exists a group of functionalities with a high degree of knowledge (greater than 50%): Content Delivery, e-mail, Task-Exercises, Mailing Lists, GroupWork, Surveys, Exams, Self-assessment and forums. On the other hand, there exists a group of bad-known functionalities (low or no knowledge greater than 50%): Podcast, Vodcast, Whiteboard, Notebook, Student Portfolio, Learning Paths, and Student Tracking.

ii. With respect to the Training received for each one of the functionalities, we can remark that in general it was scarce: there is no functionality with a high level of training greater than 25%. This is one of the more interesting results of the survey: the missing training.

iii. Figure 8 shows the Usage Level, and we can see that Contents Delivery, e-mail, forums and task-exercises are the most outstanding functionalities (high level greater than 50%), while whiteboard, videoconference, student portfolio, learning paths, podcast and student tracking are the less used (not used). If we add mailing lists, Groupwork, surveys and exams to the most outstanding functionalities, the rest of functionalities are rarely used.

iv. Figure 9 shows the perception of training proficiency for each one of the functionalities, and confirms the results of topic ii. There is a general perception of lack of training.

v. Figure 10 shows the perception of usefulness of the different functionalities. The most outstanding (with a high level of usefulness, greater than 50%) are Content Delivery, e-mail, mailing-lists, Groupwork, Surveys, Tasks-exercises, exams, self-assessment, and Forums. On the other hand, the less useful (denoting no or low useful with a level greater than 50%) have been Student tracking (the only functionality with a level of no useful greater than 50%), Podcast, Vodcast, Notebook, Student Portfolio, and Learning Paths.

vi. Figure 11 shows the preparation effort for each functionality. This topic must be considered with care, and taking into account the results of the other topics, specially the usage level. If one functionality is not used, obviously its level of preparation effort should be null. Therefore, it can be shown how the results for the less used functionalities are also the lowest in this topic, and the most used functionalities have a relative high preparation effort level, such as content delivery and task-exercises. However other most used functionalities such as e-mail and forums have not a relative high degree of preparation effort.

IV. Conclussion

In this paper we have showed the results of a survey realized in Spain about the e-learning platforms functionalities.

In short, there are two main conclusions: (a) first of all, the most used e-learning platform in Spain is clearly Moodle[4]. And in second place, and in our opinion the main conclusion of this survey, (b) it is the lack of training in the different functionalities. Therefore, it is apparent that there is a need for training on the different e-learning functionalities. If we compare the set of functionalities where the teachers have less level of knowledge (topic i), of usage (iii) and perception of usefulness (v), then we have always the following functionalities: Podcast, Vodcast, Student Portfolio, Learning Paths, and Student Tracking.

We think that the different Spanish universities have to increase the training of university teachers not only on these functionalities but also on the different methodologies linked with them, in order to obtain the best use of all of them.

ACKNOWLEDGMENT

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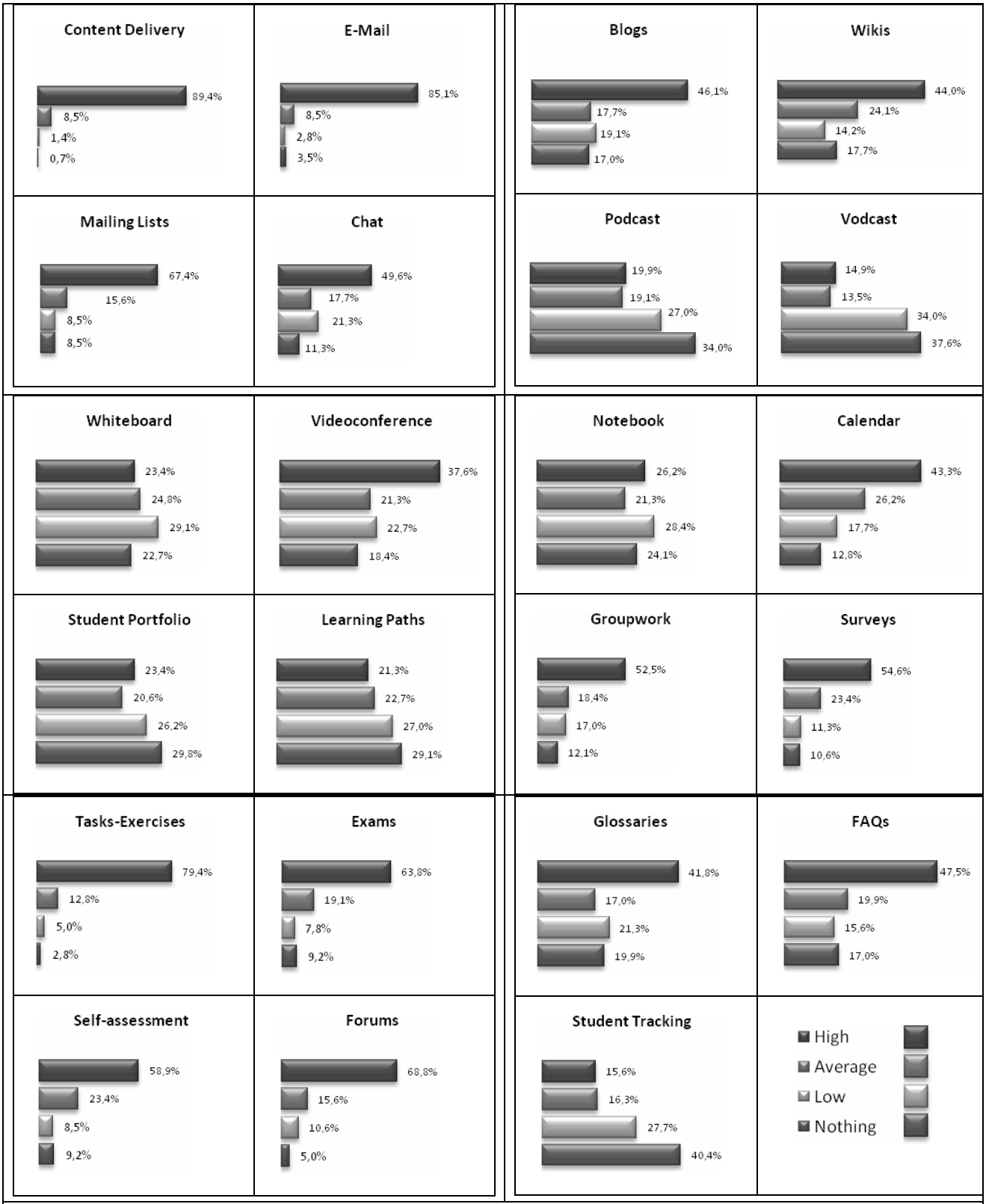

Figure 6.- Knowledge Level

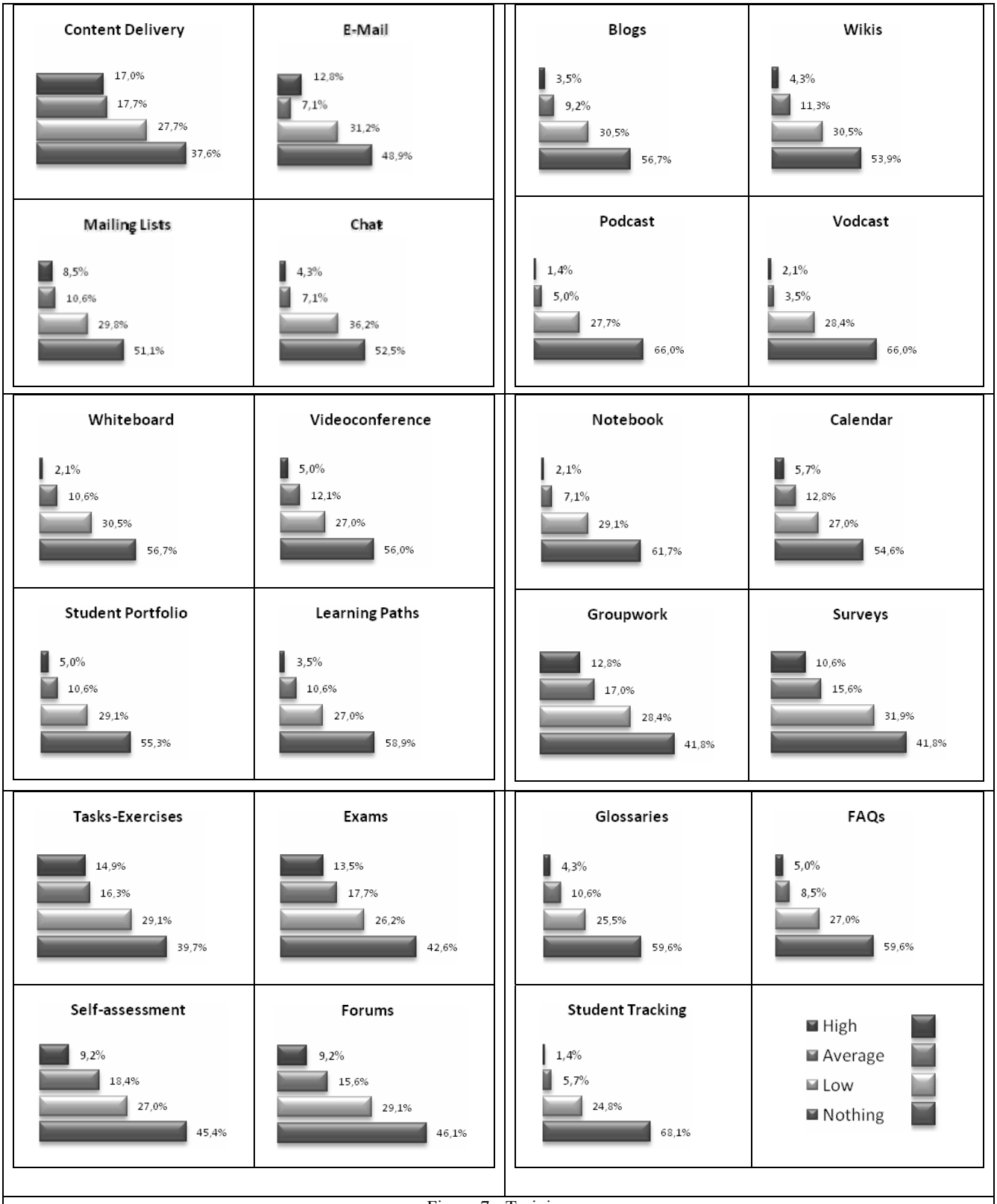

Figure 7.- Training

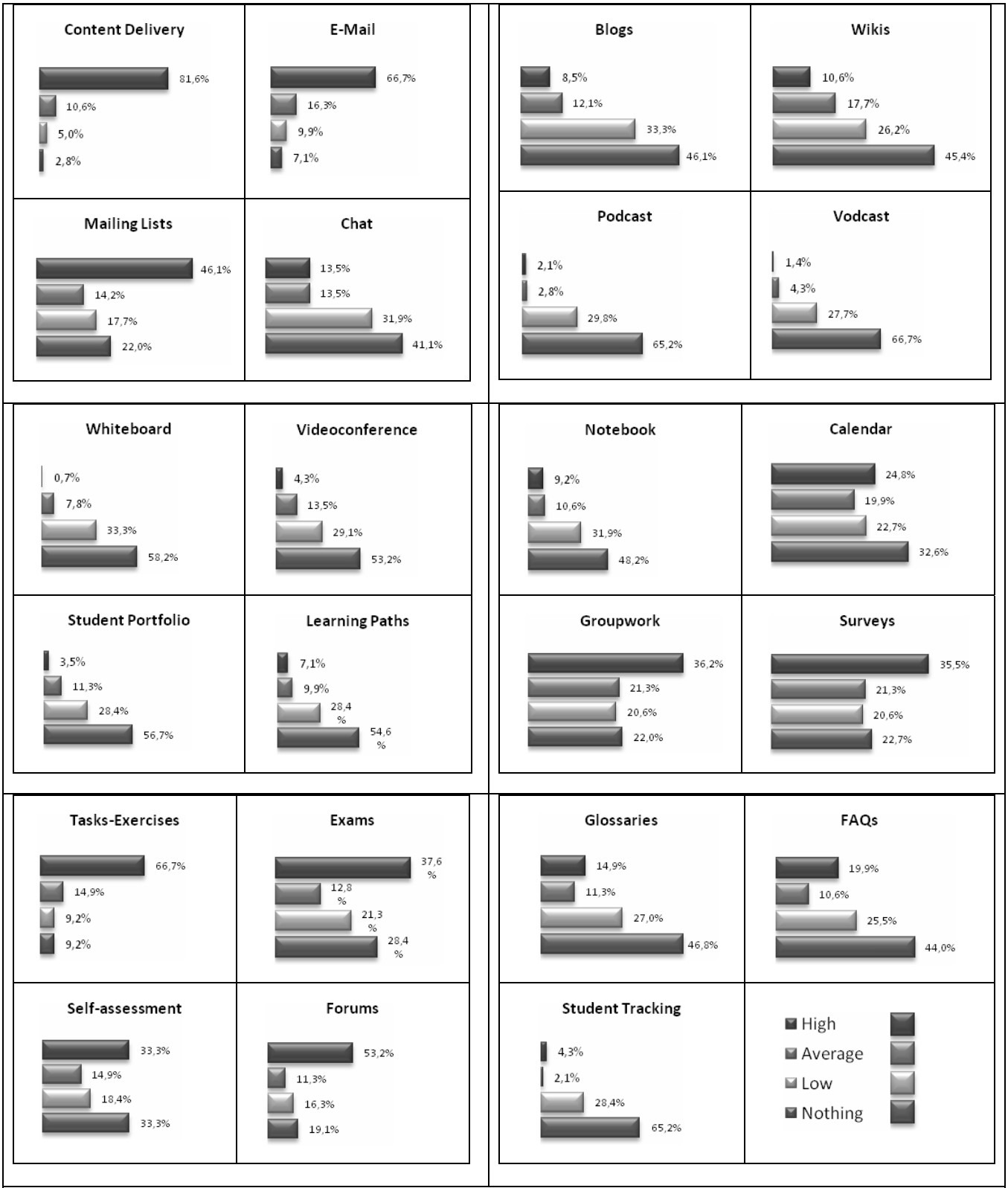

Figure 8.- Activity Usage

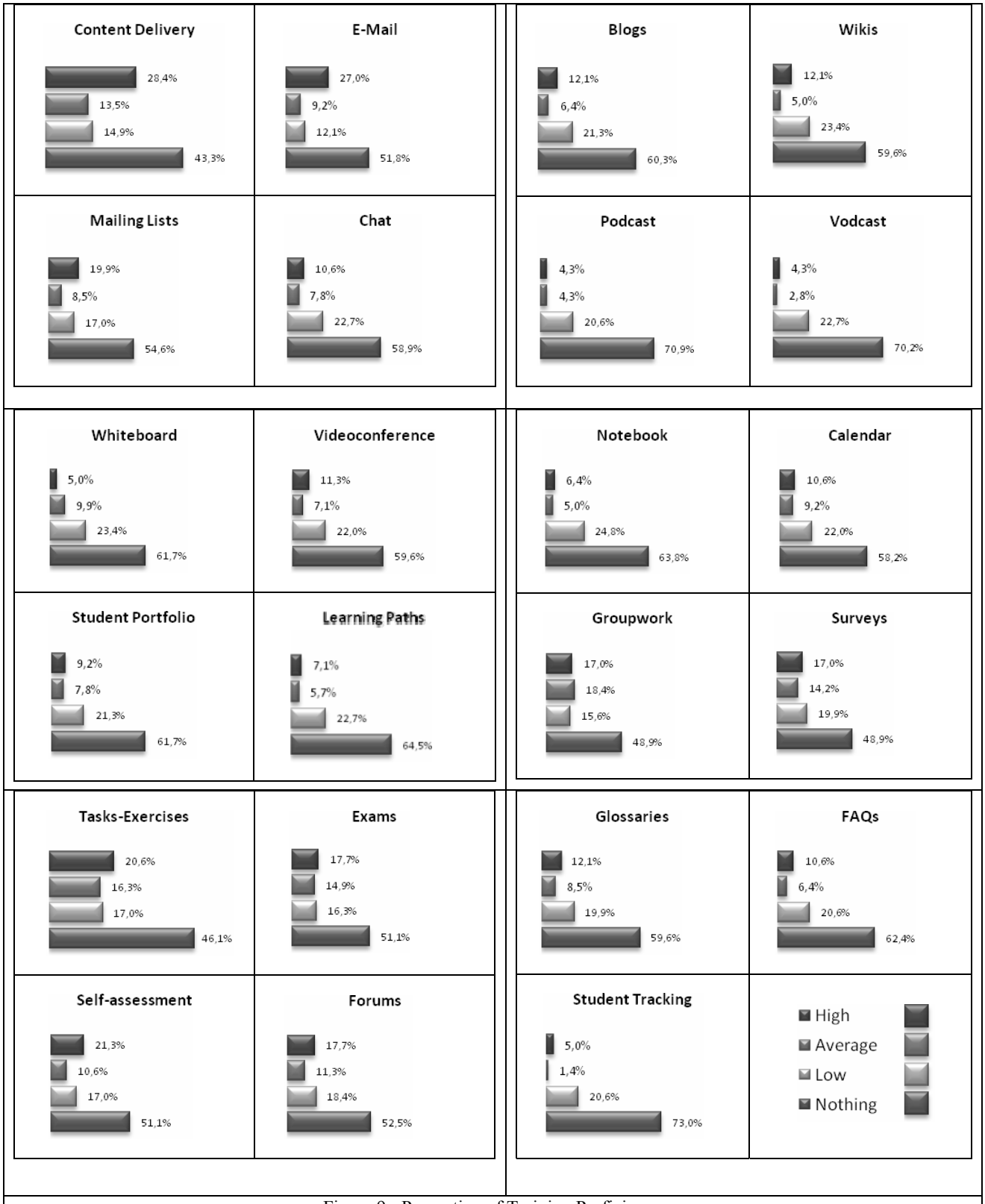

Figure 9.- Perception of Training Proficiency

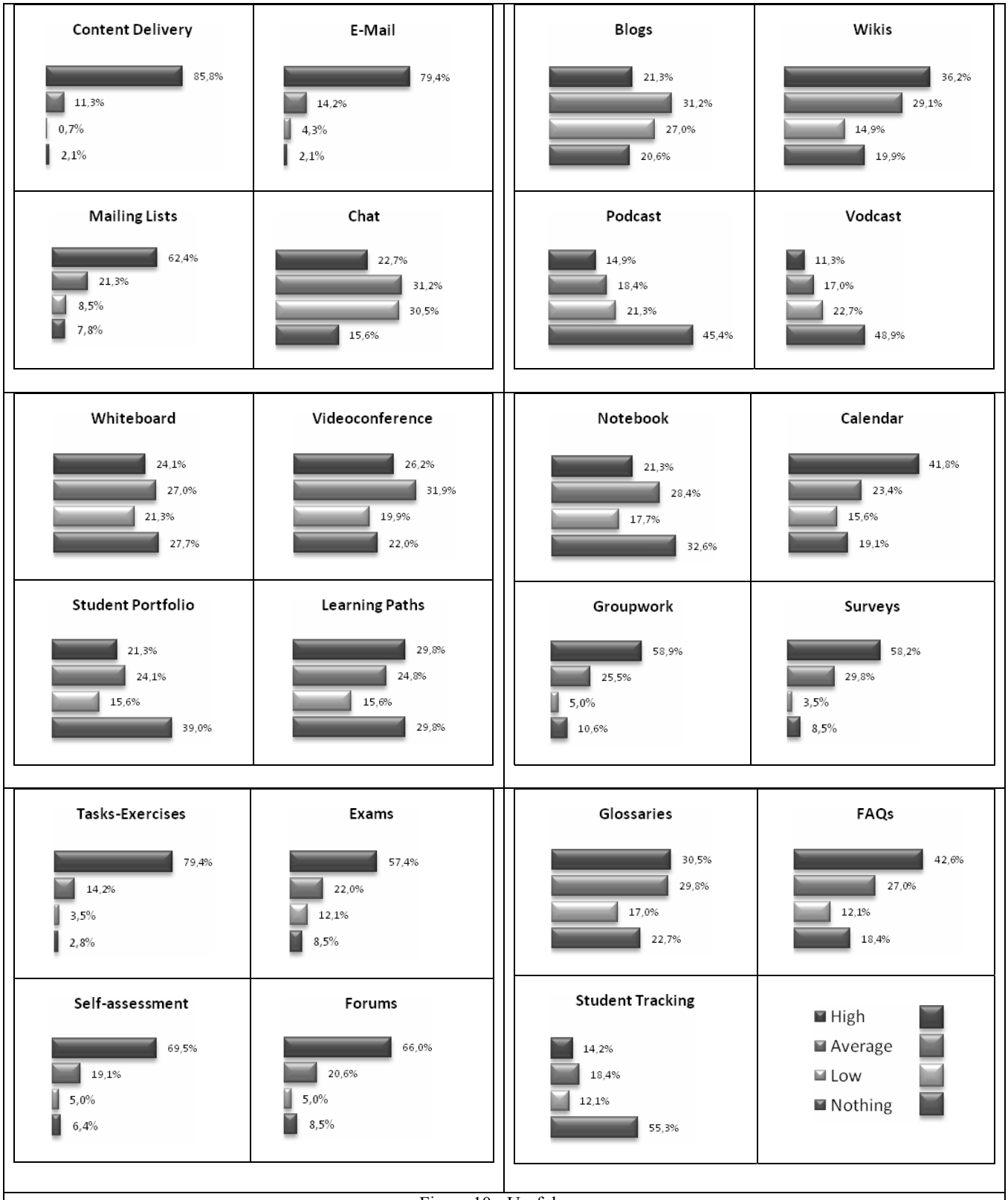

Figure 10.- Usefulness

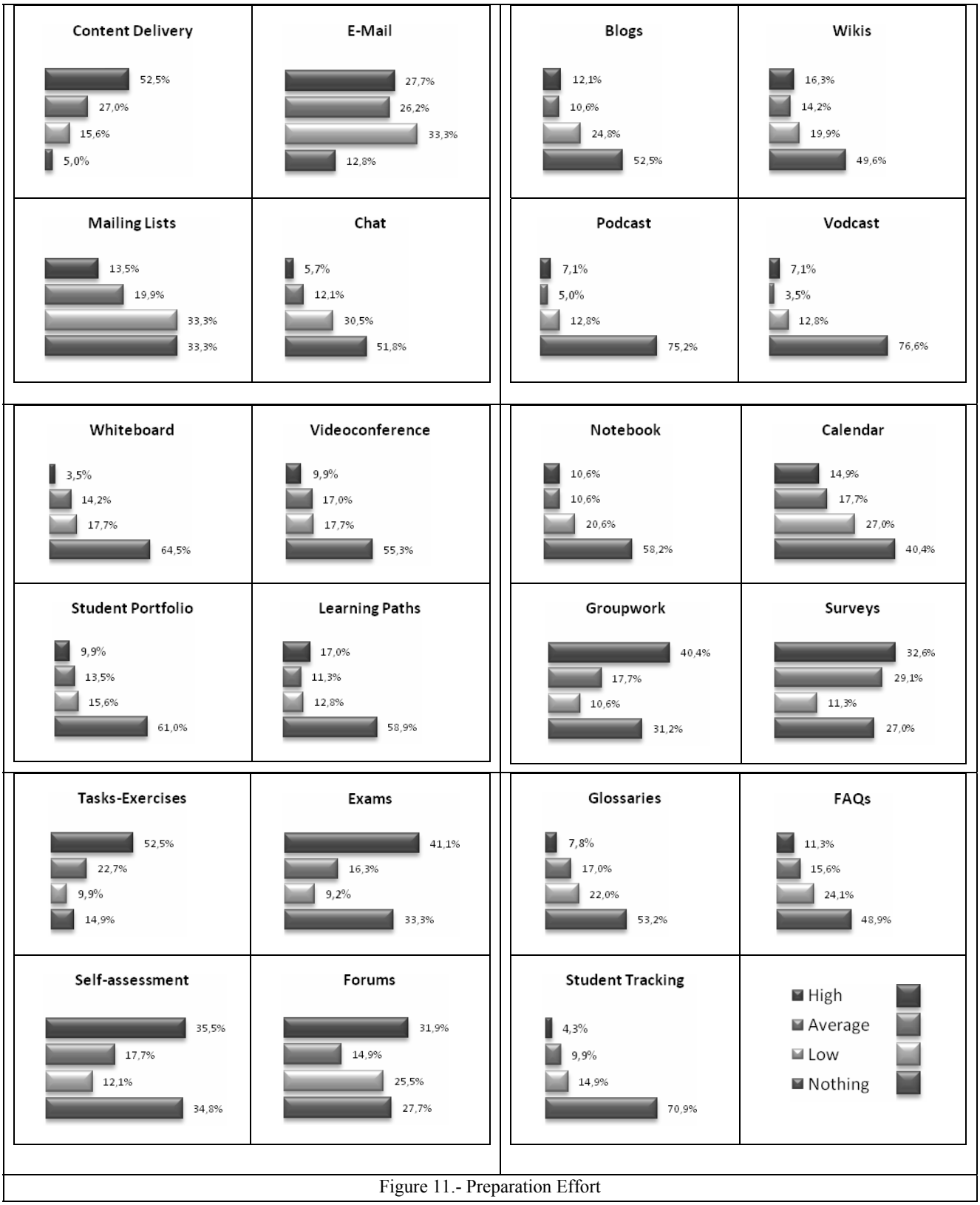

Figure 11.- Preparation Effort