Learning to Look – Purpose and Design of an Awareness-Raising Online Course in Veterinary Sciences

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Abstract. This paper reports on a work in progress: an online self-instruction course created to stimulate students' awareness processes when dealing with pictures. Using non-clinical material, the "Learning to Look" course was designed as a preliminary training to the observation of histological sections, radiological graphs, and other specialized visual material. Following a presentation of the project, salient results of a feedback questionnaire completed by 382 students about their experience of the course are provided.

Keywords: awareness, veterinary sciences, observation, visual skills, visual acuity, attentional training, clinical images, multimodal literacy, learning to look

1 Introduction

Observation is a core-competency for veterinarians and more generally for health professionals [1, 2, 3]. Correct prognosis and appropriate treatment always depend on correct identification of animal behaviors, signals, and symptoms. This "ability to look" is nowadays also directed at a growing range of images (in radiology, cardiology, endoscopy, microscopy, etc.) more and more invoked in daily veterinary practice. This context spurs the need of a renewed pedagogical reflection on appropriate ways to improve veterinary student visual awareness in use of clinical images.

2 Observed Problems

The "Learning to Look" project stemmed from observations made by a group of teachers from the University of Liege:

- students have problems when confronted with visual material like histological sections, radiological graphs or dynamic recordings of clinical situations;
- despite its importance and its indirect assessment in some courses, noticing what is in an image is not a skill taught in a targeted and coordinated way;
- several courses train somehow abilities to see. However, the specific visual material and activities they use hamper a generic and methodical approach of picture exploitation (to look, to spot, to describe, to analyze, to interpret).

3 An Online Course

To tackle these problems, an online course called "Learning to look" ("Savoir voir") was designed and offered, on a voluntary basis, to 630 bachelor and master students, as a preparation for specific courses and practical sessions dealing with clinical images. The course was divided in 3 modules: Module A - Learning to look at an image, Module B - Learning to describe an image, and Module C - Learning to interpret an image. This paper focuses on Module A which matches the general topic of ARTEL workshop: awareness.

The main purpose of Module A was to train students' ability to apply sustained attendance to an image (see examples in Fig. 1, 2, 3) in order to identify things of interest within (or possibly absent from) it. ("Recall that the basic concept at the root of attention is selection: we pick something out from the flux of the available", [4, p. 86]).

Beyond this training of "visual acuity" the module also intended to foster awareness to own attentional processes in learning activities prescribing to exercise control over how and what to look.

In the Module A of the "Learning to Look" course, these attentional processes were applied by students onto unspecific pictures (i.e. non-clinical images and without relation to existing courses). This choice was deliberate and made for two reasons. On the one hand, transversal benefits (not related to a precise type of picture) were targeted. On the other hand, using arbitrary imagery at baseline provided a soft entry in the attentional training process. Medical visuals were steadily incorporated in subsequent modules of the eLearning course.

The course was released on the institutional eLearning platform Blackboard. Students got 45 days (from March 1st to mid-April 2015) to cover it according to a self-study modality.

4 Instructional Design

The instructional design of Module A presented as a series of pictures that students had to observe. A question (see examples in captions of Fig. 1, 2, 3) challenged them to find, match, or discriminate visual elements, with a time limit in some cases (a mean time was calculated from the performance of a group of students who acted as beta-testers of the course). For each picture, students answered the question either by clicking on sensible spot(s) on the image or by selecting one option in a list. They received an immediate feedback on their answer's correctness and on the time they had spent on the image (compared to the yardstick). Feedback was also enriched with pieces of advice (e.g. "You did not find all relevant elements. Try to scan the image in a systematic way" or "You did not spot the elements fast enough. Keep in mind that speed is also a parameter of visual performance"). Following the completion of all exercises, students received a compound awareness score.

Pictures were selected in existing material [e.g. 5] and displayed in an Adobe Captivate format in order to benefit from responsive design (mouse-over and embedded countdown features) and easy quizzing. Module A was structured in 3 gradual pools of 10 to15 exercises prompting various aspects of awareness according to a semiological approach which assumes that because the meaning is not "lying" there on the picture, one has to make an effort to grasp it [6, p. 343].

The Pool "To observe and to spot" had for purpose to help students to realize the importance of sustained awareness, to introduce to a technique of visual scanning, and to understand the notion of "awareness efficiency" (ratio "time spent observing/amount of elements discovered").

Fig. 1. Exercise from the Pool "To observe and to spot". The picture (credit: ULg) came with the question: "How many animals do you see?"

The Pool "To compare and to measure" was shaped around selective awareness, systematic capture of differences, and relative dimensions of objects.

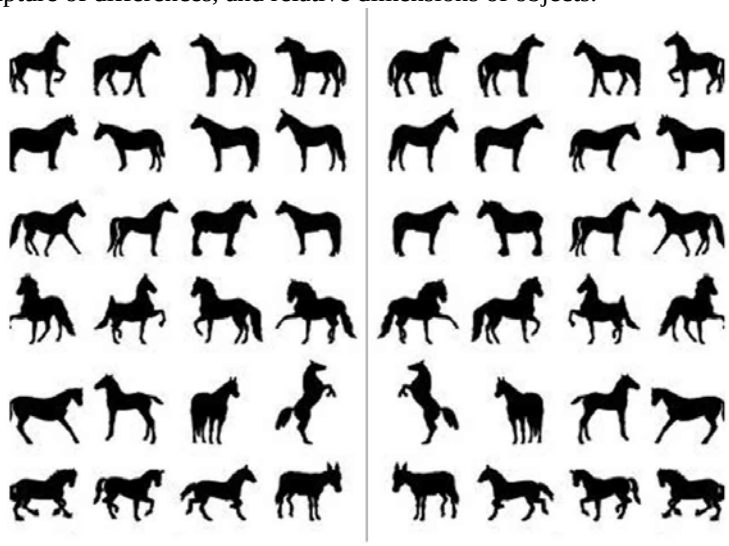

Fig. 2. Exercise from the Pool "To compare and to measure". The picture (credit: Freepick) came with the assignment: "In the left frame, click on the horse that has no inverted twin in the right frame".

The Pool "To observe in 3-dimension space" revolved around shape matching and mental construction of 3D objects from either sections of these objects or from 2D representations.

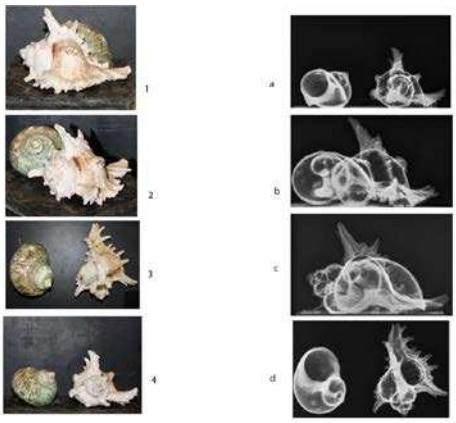

Fig. 3. Exercise from the Pool "To observe in 3-dimension space". The picture (credit: ULg) came with the assignment: "Associate each view to its corresponding radiography".

Two reflection amplifiers [7] were added to Pool A in view of prompting students' metacognitive introspection on their usual way to look and, in contrast, on the value of the visual scanning approach proposed (Fig. 1).

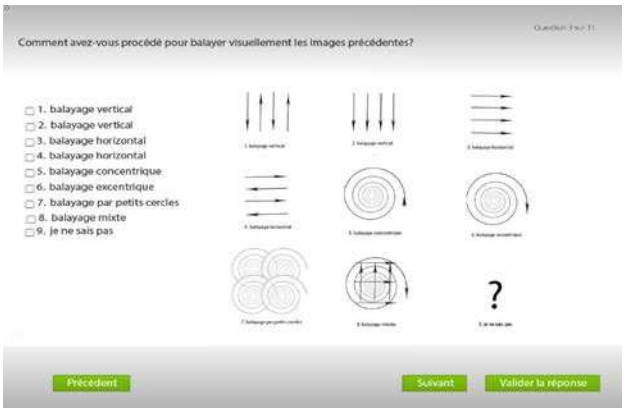

Fig. 4. Structured reflective episodes questioned students on their spontaneous way of observing and on their possible improvement through visual scanning.

5 Feedback Questionnaire

A feedback questionnaire about the course was sent to the students. It comprised multiple choice questions coupled with open fields for written comments. It was filled in by 382 students, with the following results:

- 84% agreed or totally agreed that the exercises contributed to a reinforcement of their ability to analyze an image;
- respondents elaborated on the benefits: "I have learnt to go beyond what is the most visible in a picture" (50%), "I have learnt the technique of systematic approach (48%), "I have learnt that you can miss an image if you do not spot all important elements (44%);
- 80% were in favor of a module dedicated to digital imagery and based on the same principles;
- despite their appreciation of the "Learning to look" course, some students mentioned that it added workload to an already heavy curriculum;
- some students complained about the exercises for which missing only one image element out of many deprived of all the points.

6 Discussion and Future Work

Concern for the training of awareness is a long-standing issue. In 1942, the French philosopher S. Weil assimilated the major outcome of formal education to the development of attentional skills: “Although today this seems unknown, the training of the faculty of attention is the true goal and almost only value of all study. Most school exercises have a certain intrinsic value, but this is purely of secondary interest. All exercises which help to develop the power of attention are of interest, almost equally so. (…) Those who spend their formative years without developing this faculty of attending and directing mind to an object have missed a chief treasure” [8, p. 85]. Since then, other works [9, 10, 4] have stressed the importance of awareness (and germane notions).

Amongst possible objects of attention, pictures form a distinct category. Becoming visually literate is considered as an important endeavor for students, especially nowadays in veterinarian and medical education wherein static and dynamic digital imagery has gained momentum [11]. Indeed, at the same time, efforts are made to partly automatize recognition of terabytes of imaging data produced in many domains. But even the best algorithm-oriented processes does not discard human intervention and hybrid human-computer approaches of visual interpretation still appear as relevant [12]. Developing visual awareness remains therefore critical, not to mention its importance in new technological areas (augmented reality, quantified self, learning analytics, game-based learning, remote sensing imagery, etc. [13]) generating images that both burden and relieve attentional resources.

If eye can learn and must learn, the question of how to teach it is open [14, 15, 16]. The “Learning to Look” project offers a concrete, grounded in practice, and large-scale attempt to exert a competency which is seldom trained for itself, despite its paramount importance for future veterinary practitioners. This instructional setting, promoting a straightforward attention drill, must be further analyzed with regard to its relevance, efficacy conditions, and contribution to multimodal literacy development [17, 18, 19]. In this respect, a detailed assessment of gains in image handling, conveyed both by Module A as such and by the whole course (Module B - Describe an image and Module C - Interpret an image have been made available to students) is planned for the future.

Since the “Learning to Look” course is based on the assumption that awareness development can be stimulated through training from the general to the specific (from arbitrary to clinical images), instructors also plan to explore the possible use of the online course beyond veterinary sciences.

Based on students' positive reaction on this first run of the module, the instructors will ascertain the best schedule regarding the course release. Offering its content according to a distributed practice scheme [20, 21, p. 114] along the year – instead of a massed practice during a short period – could expand the benefits of the module and foster more sustainable learning. Technical options for an improved tracking of students' actions and scores will also be inspected.

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