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Diffusion Process of Virtual Consultations in French Medical Training: A Socio-anthropologic Approach

Caroline Simonpietri

Population and Development Centre Laboratory, Institute of Research Development (IRD), Paris Descartes University, Sorbonne-Paris-Cité, Paris, France.

ABSTRACT

Still emerging, simulation tools, like plastic or human models, seem to be more and more used in French medical universities. Simulation places the doctor apprentice in situations, often of emergency. They can also develop medical skills, through practice, without any possible harm for the patient. More than an »active« training, these tools allow the acquisition of »know-how«, in front of a patient like with the other caregivers. They also allow teachers to evaluate the clinical reasoning of their students, previously taught in books or lectures. What about virtual consultations on digital support such as a computer or tablet? What knowledge may this type of simulation convey? What can it bring to doctors? How to use it? What are the obstacles to its diffusion in medical education? To answer these questions, we have conducted several participant observation studies over two years in a digital agency, specialized in creating serious games for health care. In partnership with the University Paris Descartes, this mixed approach from public and private sectors, offers an original point of view of an »innovation under construction« a creation and storage platform of virtual consultations for health professionals. So, in a qualitative, comprehensive and inductive approach, we offer to analyze the diffusion process of virtual consultations in medical training, from its invention to its reception by final users. In this article, we detail the" socio-anthropological approach which we applied at the heart of the industrial sector of an occidental country. We also present the changes which occurred in the French medical training at the beginning of the 21st century. Then, based on these identified changes, we describe the tensions for the use of virtual consultations as a pedagogical tool, in France.

***Keywords: Medical** Training, Virtual Consultation, Socio-Anthropology*

Introduction

Simulation is »a method of teaching, for tasks which a direct teaching proves to be impossible for ethical (security and safety), economic (cost of equipment) or technical (very weak probability of occurrence of the incidents or accidents) reasons. The objective is to learn how to reproduce in the most realistic and faithful way the expected behavior«[1]. It is an old practice of training having known a broad diversity of evolution and fields of action in particular with the explosion of digital technologies at the beginning of 21st century.

In health, the first simulations were carried out in the 18th century to sensitize and exert women in campaigns to »child's delivery«[2]. These trainings would have permitted a major reduction in children mortality[3,4]. Thereafter, various increasingly technologically sophisticated models were created. For example, at the beginning of the Sixties, the first plastic mannequin controlled by a computer, called »Sim One«, was created[5]. In parallel, the use of »standardized patients«, i.e. a person who simulates a patient, remained still largely employed for medical trainings6. These two types of training per simulation, material or human, already existed with Platon. The simulation of war scenes had already been worked out for soldiers and appeared effective for training for combat. Then, with the Renaissance period, the role-plays and the theatre emerged and was regarded as a »pedagogic art«[2]. Nowadays, these tools appear largely used with international, in particular in North America, in the initial teaching of medical and paramedical professions. The most frequent therapeutic fields concerned are anaesthesia-reanimation, medical emergency treatment and nursing care.

In medical training, three types of trainings are necessary to deal with patients in order to detect symptoms and finally, to establish a diagnosis and a follow-up. First of

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all, a „semantic" training of the clinical reasoning, then a procedural training of the technical gesture and finally, a relational training that we qualify the »social« or »human« one. These three trainings allow acquisition of three competences which are gathered in literature as respectively »knowledge«, »know-make« and »know-how«[3]. In the tools for simulation, used by the universities of medicine, the plastic mannequins are used for the training of »know-how« in order to acquire procedural reflexes. On the other hand, »human« simulation, with actors, allows to be sensitized with the »know-how«.

What type of apprenticeship training can be provided by virtual consultations on a digital interface like a computer or a tablet? What can these new tools contribute to the initial and continuous training of health professionals in comparison to others tools? How can this innovation of the 21th century be diffused in medical education?

Methodology

According to Latour (1992)[7], to understand an innovation, it should be observed as »being done« or »under construction«, an approach which we applied for two years. In the middle of a private company, specialized in digital formations in health, we could observe, in a qualitative, comprehensive and inductive way, the process of diffusion of virtual consultations, from their conceptual creation to their concrete reception by the final users, the health professionals.

»Socio-anthropology« and reflexivity

Within the company, as to the customers and final users, the researcher was introduced like a »socio-anthropologist«[8,9,10] in university partnership with a research laboratory, CEPED (IRD) of the university Paris Descartes. Several reasons brought on this label. A suitability which we estimate the most precise to illustrate our industrial and our academic functions.

First of all, our analytical approach takes as a starting point the sociology of the organizations of Crozier (1963)[11] and of the methodological individualism of Boudon (2003)[12] while our method of data collection wants to be rather ethnological, centred on practices and objects[13,14,15]. The overarching method is thus between two disciplines. Moreover, the term »socio-anthropology« was developed by Bouvier (1984)[8] who studied the work conditions in corporation. It applied methodology from the discipline of anthropology, mainly the participant observation, in »modern« companies which is precisely the approach employed in this work of study. Lastly, the distinction between sociology or anthropology at the 21st century no longer make sense with globalization. »Western monoculture«[16] is diffused on the whole of the territories, which attenuates the cultural singularities by the reproduction of the social systems, equipment and symbolic systems identical. Thus, »the distinctions of a little mythical past do not exist anymore; it is truer only the sociologists deal with on our premises and the anthropologists occupy

Fig. 1. Screenshot of the frontoffice of one virtual consultation of PatientGenesys plateform.

moreover world nor that the sociologists employ quantitative methods and anthropology the ethnography«[17]. Anthropology thus takes a very particular turning in the 21st century, since the discipline, which, at the origin, studying »the others«, those which were »different« socially or culturally speaking, grows blurred in its comparative analyses with the globalization of » contemporary world«[18]. We define as »contemporary« those which share the same historical time and thus all the standards, values, symbols and practices which are dependent there.

If some authors, like Levi-Strauss (1995)[16], seem to express a certain concern as for these changes, others, like Augé (1994)[18], think on the contrary that they will allow a revival of the methodical practices employed. Precisely, with this work, we put forward a new empirical approach, in the middle of the companies of the western contemporary worlds, an approach still incipient, close to a »search-action«[19].

Sampling

A first project concerned the construction of virtual consultations on a creation and storage platform called Patient Genesys (Fig 1). In this project, 20 students and 15 doctors were interviewed, filmed and integrated in our sample.

First of all, we have presented the platform in the form of a slide show. After having observed their reactions, we could collectively and individually discuss points of improvement with ten students. One year later, the almost final platform was tested by ten other students and different teachers of different disciplines. Then, over a period of three-half days, the students were divided in small groups. The first consisted of three third-year students. The second group consisted of four students in their 5th year. The third group consisted of a teacher and three interns in urology. As much as possible, we finished, each session by asking a few individual questions based on the group discussion. The others teachers have been interviewed while they were created clinical cases on the platform.

Moreover, about forty doctors of various specialities were interviewed within four projects for the continuous medical education. This group also included doctors in activities, recruited by pharmaceutical firms. Other actors like medical delegates, project managers and nurses were also filmed. Only those with which the exchange lasted at least thirty minutes, besides an observation in situation were kept in the final sample.

Results

Clinical cases in French medical training

The necessary medical background in consultation, for the development of a diagnosis and a therapeutic follow-up, relates to the disease, its biological mechanisms, its symptoms, its treatments, its psycho-social consequences and its institutional recommendations. This knowledge, if it is static at one T moment or over one short period like a doctor visit, is dynamic, evolutionary and flexible by the multimodal contribution of new knowledge as pharmaceutical industries, patient's associations and institutions. It especially depends on the knowledge acquired and accumulated in the long-term memory of the doctors since their initial training at the university. This initial knowledge is acquired gradually by practice and teaching.

In the first case, knowledge is qualified as »informal« and is learned first of all with the patient during hospital internships, then through practice after graduation. At University, the initial medical training seems to be usually made by observation and imitation toward of lack of time doctors can devote to the explanations. Besides the practical internships, initial training at the University brings primarily theoretical knowledge, called »clinical reasoning«. This »formal« knowledge, resulting from books and lectures, is not transmitted either without any difficulties. It is not enough to only have one transmission of a message during the teaching trajectory because knowledge is acquired definitively through repetition before it is stored in long-term memory. Each student has to learn, i.e. builds or rebuild in their own head what »trade will become its final and durable knowledge[20]. Clinical cases can also be realized in front of a »real« patient as well as on paper for training purposes. They can also be carried out through simulation tools. For example, the training of technical gesture, and thus of »know-make«, can be carried out on a plastic mannequin, while some hired actors can coach the students with the announcement of »bad news««.

Nevertheless, their respective cost slows down their frequency of use near students who generally observe and learn from other students. For the university, an unquestionable projective advantage of virtual consultations, »is to manage to save time and money to manage to make pass a large volume of students, on the training of the clinical reasoning, the interaction with the patient, for whom one would like to make real simulation, but one cannot materially« (Interview, doctor, Director of the UFR of medicine). The digital simulation could also be an economic and temporal gain compared to the two other simulation tool. Moreover, the evaluation modalities return to the resolution of clinical cases online and not to settings in situations with plastic mannequins or actors. The virtual consultations seem more close to the evaluation and especially the final one: »Arrived in 6th year, they pass the competition of the » internat » and at this time, they have a ranking and according to their order of arrival to the merit, they have the choice and the specialities most asked whether they are classified in the 20 first« (Interview, Nurse, anaesthetist).

University evaluation's modalities: from editorial tests to the first digital exam

In France, after six years of common courses, students pass a final examination called the National Classifying Examination (ECN). Originally regional and excluding the future general practitioners, this examination became

national and compulsory for the totality of students in 2004, indifferently of their first choice of orientation. The future general physicians have to pass competition and become finally integrated into the final ranking and not only the one having for objective a hospital specialty. Few years after, in a challenge of cost cutting of time correction, this national testing has been digitalized, through a man-machine interface, the tablet. In 2015-2016, the students of the sixth year were the first to pass these numeric tests. In this purpose, they have been involved for their 4th year, on the progressive files of platform SIDES (Distributed Computer System of Evaluation in Health). These clinical cases are presented in short text form with some questions which appear the ones after the others without any possibility of behind once returning a given and validated answer.

Previously, the final competition rested on editorial tests on the basis of text describing a clinical case. About fifty items, specified as a preliminary by the originator of the case, had to be found in the copies by the teachers. With the digitalization of examination, these editorial tests would be too heavy for the platform. The test is composed of QCMs which have to be presented in the shape of »progressive files«. For some doctors, »that approaches looks more like true life like that« (Interview, general practitioner). Teachers were rather in favour of this pedagogic approach although it treats only clinical reasoning: »but that remains a very technical assessment, very formal, and one does not test at all the interaction and the capacities of the student to deal with patient as a whole« (Interview, Director of the UFR of medicine). Nevertheless, as mentions it: »For the first year, the ECN will occur in a data-processing way with of QCMs. But, gradually that perhaps will grow rich with videos by patients, sound… We could imagine that the computer tools which make pass the ECN enrich towards virtual simulation«(Interview, Director of the UFR of medicine).

The strategic challenge of students until this ECN concerns their ranking and so the biomedical knowledge by QCM as testing in the examination. The SIDES, which propose the clinical cases of the ECN, has major asset, and even has monopoly within the universities of medicine. This, as long as this form of examination, to evaluate and divide the students according to their ranking, remains. Moreover, the setting online of the clinical cases by progressive files initially aimed at has more meticulous distribution of the students with the ECN, as well as cost cutting of correction. The virtual consultations of PatientGenesys offer a framework definitely less rigid than QCMs of the ECN. They would complicate considerably the marking system, which lets suppose a use for the final evaluation in the far future, in spite of regrets of some teachers who talk about „a drift transistor of the current system" (Interview, doctor, cardiologist).

Therefore, their uses by the students depend on the interest of teachers to integrate it in their courses and for intermediate evaluation, before the final examination. Some students would also like to use it to involve themselves, individually or »between buddies«. However, before being whitebait to involve itself, the platform has to propose a sufficient bank of clinical cases, i.e ten per speciality and year of study. It is necessary that many doctors approved to create cases on the platform which they are generated. A second challenge for the diffusion of the virtual consultations, after the final evaluation modalities, returns to the time creation of this clinical cases database.

This leads us to question: how virtual consultations, as the one proposed on PatientGenesys platform, are built?

The construction of the clinical cases in PatientGenesys: time-consuming for the teachers and expensive for the university

Creation time of a clinical case by teachers also changed with the evolution of evaluation modalities. The editorial tests took less time than the progressive files to be conceived: »a progressive file takes between two and three hour of design, including the conception, the seizure, the checking of the answers, and also the research of documentary resources like radiology photos« (Interview, general practitionner). With the editorial tests, they were »in another system, it was much easier to create, one spent one hour. Even not, in half an hour one could constitute a file with 8-9 questions and create the base of an answer« (Interview, Director of the UFR of medicine). If the time of creation of a progressive clinical case takes more time than that of an editorial test, the time devoted to the correction decreases considerably: »On the other hand, the time of correction is proportional to the number of students. If one had an ability like us, with 170-180 students in a promotion, it was 7-8-9h corrections. Thus time was distributed in a very different way and the teachers often tend to forget time that it was released to them by the correction« (Interview, Director of the UFR of medicine). One of the challenges for diffusing digital simulation tools is partly the time for the creation and correction of virtual consultations.

Indeed, »one of the very delicate points will be the facility for the teachers to create clinical cases of virtual simulation. It is necessary that they seize the subject and that they agree to spend time to conceive« (Interview, Director of the UFR of medicine). According to the teachers, a clinical case on the PatientGenesys platform takes nearly ten hours to create: »The development of an editorial test took approximately thirty minutes with the doctors, while the progressive files are written in 1:30 – 2h if it is an experienced teacher. But it takes 10-20h to make a clinical case on your platform« (Interview, Director of the UFR of medicine). And, as explains it the director: »We cannot retranscribe that one released 8 or 10 hours of correction to ask the same time of creation.« (Interview, Director of the UFR of medicine). Moreover, University has to remunerate the teachers, especially if work is consequent: » It shouldn't be too long or teacher won't do it without any remuneration.« (Interview, Director of the UFR of medicine).

In sum, the seizure of a clinical case in a platform like PatientGenesys is time-consuming for the teachers and expensive for the university. There is no strategic interest for the teachers to create cases on a PatientGenesys platform. To do it, they must be under constraints: »After, the

teachers can be adaptable. As the students, they will make it, if it is easy and if it's include in a form of examination, the final one, as well as the intermediate ones.« (Interview, Director of the department of medicine).

Who are the actors responsible for the methods of evaluation relating to the ECN and what would be necessary to convince them of the utility of virtual consultations, if there is any?

Power of public institutions on the evaluation of modalities: for a restricted targeting of the digital simulation use

The decisions concerning the national evaluation are coordinated by the ministry for National Education and Research and the National Centre of Management with interaction with each other »which is not simple« (Interview, Director of the UFR of medicine, PG). These »social roughness« slow down any proposal for an improvement by the academics.

However, except for this final examination, teachers are free to propose some form of exam or training with the virtual consultations along the six first years of studies. But, as long as examination remains national, the teachers will seek to prepare their students as well as possible with the approach of progressive clinical cases. On their side, the students, as from the 4th year, are completely focused on the final examination: »The students focus their attention on what they are evaluated. And if they are assessed on the biomedical one with QCMs, it is what they will work« (Interview, doctor, urologist). Therefore, from the fourth year, and as long as the nationalization of examination in the shape of progressive files is maintained, it is not possible to evaluate, nor to even train the students of 2nd cycle, i.e. from the 4th years to the 6th years, with virtual consultations, because they seem too far removed from the methods suggested by the national examination.

Consequently, the students of the first cycle, i.e. until the 3rd year, can represent an interesting target for promoters of the platform because they are not yet the focus on the final competition: »So today the ECN remain QCM on tablets, so the target is rather students of 1st cycle. If it is becoming the method of evaluation, everyone will be obliged to start to it. Otherwise, that will be a tool among others« (Interview, intern, urologist). Moreover, the training of the first cycle does not appear always optimal to the students: »There is nothing for the second to third years. We work on papers clinical cases, without correction, without returns, the objectives are rather not very well defined. Thus I think that there is really something to make for the second and third years« (Interview, student, 5th).

After ECN, we could imagine the clinical cases being a good option. Prepare this examination would not be main goal of students in 3rd cycle, i.e. the »interns«. But, »over the first six years, it will be easy to put everyone in agreement. But after, that it evolves too quickly, and there are specializations for which I am not sure that it is relevant to create clinical cases« (Interview, Interns, Urology, PG). So once the exam passed, in hospital specialty, the clinical cases are very specific. There is no consensus on medical care because the cases are often complex, evolutionary and riddled with unpredictable factors typical of the medical community: » In fact recommendations are very very technical and should be re-actualized all the time« (Interview, Intern, urologist). So, after the national exam, only those of general medicine could find it interesting to involve themselves with the platform: »There are the general practitioners who will be interested by this support because it is the true life and that there is an infinite potential. They don't feel very at ease on that…« (Interview, Intern, Urologist).

However, in general medicine, the doctors are confronted with other difficulties, namely the patient's relationship. What can bring virtual consultations for the »know-how«?

Virtual consultations for relational learning: a gap between reality and virtual situations

The speech of a »real« patient appears to the expert like an enigma to solve among a set of »false« indicators: „To interrogate a patient, is like an investigation, one needs to go and seek the elements" (Interview, doctor cardiologist). Two reasons are identified to justify this concept »of investigation«: »Either the patient does not want to give these elements. Or on the contrary, there are extremely voluble patients« (Interview, doctor, cardiologist). So, according to the doctors, the patient can remain either too secretive or too scattered in their speech not knowing what information the professional is seeking: »He wants to tell us many things and he does not know what we are looking for« (Interview, doctor, cardiologist). The doctor needs to find the key element which will enable him to correctly diagnose the patient among this flood of useless words. This logorrhoea can come from stress which the patient needs to discharge during the doctor visit: »He needs to evacuate its stress but that is not useful for diagnosis.« (Interview, general practitioner). If the patient relieves himself by this chattering, it can block the doctor in his reasoning.

According to the general physicians, what is apprehended returns more to relational with a patient than to pure scientific and biomedical questions. They must establish the links between the various symptoms and touched bodies. Their work often initially leads them to, in a first step, understanding the patient, his symptoms and its expectations. This work can especially be tiresome when facing quiet patients or on the contrary those with strong logorrhoea. In this last case, the expert finds himself in need to carry out an investigation among the diversity of information which the patient transmits to him, whose majority can prove to be useless with the development of the diagnosis. Unforeseeable behaviours can also be denounced like adding to the difficulty of the consultation, for example a lack of sincerity on the reason of the visit. They can, for example, ask for screening tests while they initially only came in for a headache. Then, »a difficulty with the virtual tool will be to manage how to reproduce this fuzzy side, because if the computer answers exactly the question of the doctor, it is not exemplary of real life« (Interview, Director of the UFR of medicine, PG). The virtual patient does not reproduce certain character traits, like upset and

angry behaviours, which seem to occur regularly with a flesh and bone patient: »and then the avatar does not answer as can do a patient. It cannot be irritated or go away abruptly« (Interview, general practitioner).

Moreover, it frequently happens that a patient asks a final question when they are about to step out of the door. However it was not possible to add these unexpected behaviours in the application at the time of the investigation. One teacher would have liked to add constraints and one realized that it was not possible, one would have liked for example that spontaneously the person at the end of the consultation on the way out says »In fact, I actually have trouble with my shoulders. That occurs very often in general medicine, but the tool was too constrained to include this kind of things« (Interview, teacher, occupational medicine).

The conversational agent (Fig. 2) does not seem enough credible at the moment because it cannot reproduce psychological and behavioural complexity of human beings. It is less capable of reproducing unpredictability during the consultations. However, if doctors offered overflows of improvement to approach their clinical practice, they perfectly realize that these modifications are not achievable goals in the near future: »We can't hope to be able to converse with an avatar like in real life. The one which discusses, it is not for tomorrow! It would be an incredible development. I see that in maybe 10-15 years…« (Interview, Professor of medicine, anaesthetist).

In conclusion, there is still a long way to go before the conversational agent can transmit any know-how: »There is still many steps to cross, before to create all the wealth of a consultation with a patient, and his numerous approximations. Reality is not as clear-cut as answers like »yes or no« (Interview, Director of the UFR of medicine, PG)«.

Virtual consultations for continuous medical training: the pharmaceutical firms implication

Once graduate, after the third cycle, the training, mainly worked out by the pharmaceutical firms. This training permit doctors to maintain their stocks of semantic knowledge, made up hitherto. They also update this data on new treatments, as clinical trials in progress or as new institutional recommendations. Therefore, the physician's diploma is obtained, the doctors must remain reflexive, because, even as interns, the more specialized they are, the less probability of treating similar cases they have. Virtual consultations in continuous trainings already exist and are widespread in France in a collective way: »With this tool, one created a teaching approach that is also a learning approach. The objective is rather to address the doctors who are around the table and to make them reflect on their practices« (Interview, project manager, pharmaceutical firm). For that, the application is built in two steps.

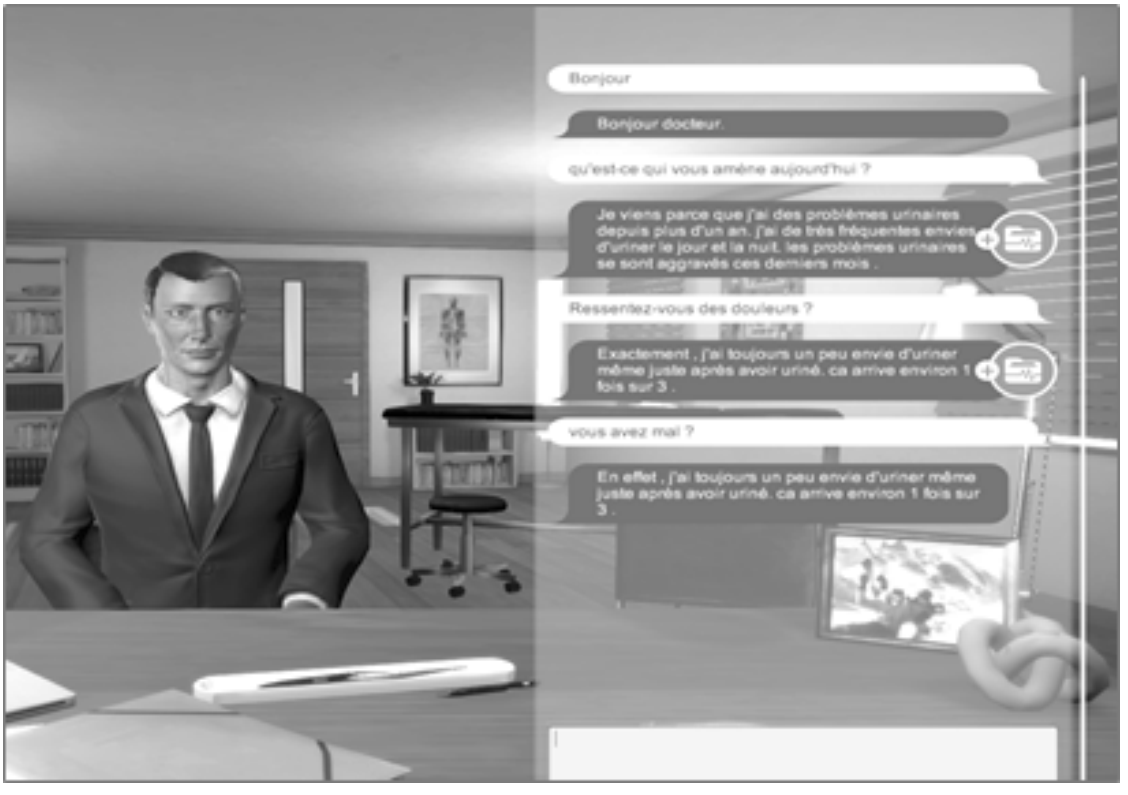

Fig. 2. Screenshot of the conversational agent of PatientGenesys platform. Users can write their own questions and discuss with the virtual patient instead of click on pre-establish sentences.

First of all, a free exploration in the graphic interface makes it possible to work out a diagnosis individually and to propose complementary examinations or an assumption of responsibility. Then, a phase of exchanges between coworkers takes place on the virtual practices carried out by the group. A »doctor leader« may lead a lively training. He must have three competences to make an efficient formation: medical expertise, some animation skills and some technical knowledge for the use of the digital object. Guides, or instructions, make it possible to model the clinical case suggested by the writer and to adapt it to each group. They also explain how to install the tool although that is generally done by the medical delegate or a technician from the digital society. This last practice was more symbolic than a true utility but it could lower the potential tension during the installation of the iPads upstream collective training. No guide was produced to learn how to deal with the group of participants as if the animator's knowledge was not a challenge.

However, the success strongly depends on the attitude of the »professor« or animator with his learners and on his aptitude to teach in an »active« way and not in a paternalistic and passive way as we have observed in some training. The lack of competence in animation with the digital tool could bring important diversions and slow down the learning imagined by the originators. So, according to our results, the lack of animation skills with the digital support of the leader is the biggest constraint for the diffusion of innovating tools such as collective virtual consultations. Or, »professional simulation is not a game. It gives to see competences, the failures, questions the ego of the professionals, and can cause a real emotion of the participants. These dimensions can usefully serve skills acquisition, but their gradation must be particularly controlled, and probably applied with understanding according to the personalities of the operators, because the operator is the only element not simulated«21.

Discussion

With »simulation«, users are guided along a tallied, arranged course that is sometimes amplified, but always based on practices and situations of real life. They can see the consequences of their simulated actions varying according to the choices carried out throughout the course of simulation. They are not passive any more in front of a teacher or hierarchically superior but become involved in their training without the risk of doing damage to patients. Indeed, by practise, the physician's progress and learning through an »active« approach can limit possible consequences for patients that can become particularly injurious especially with the complexity of some cases. Government also supports the practice of upstream patients on simulation's tools to avoid any dramatic consequences on real patients.Nevertheless, different tensions could be identified for the use of virtual consultations by the doctors. Among others, the modalities of the final examination and the gap between the clinical practice and the virtual environment can be noticed.

The final examination, an old ritual which obstructs the diffusion of digital simulation in initial training

Human training requires a set of cognitive operations such as comprehension, the memorizing and logics of inductions. These abilities lead the retention of new knowledge after a long process of consolidation in the long-term memory by individual as well as collective practice. It is the repeated resolution of clinical cases, virtual as well as »real« one, which permits acquisition of biomedical knowledge. The progressive files set up by the SIDES, can precisely be involved in the clinical reasoning. These clinical cases, online, are not only used to consolidate knowledge of students throughout initial training, but also to evaluate them before their passage in the third cycle, called »internat«. Indeed, the biomedical training is evaluated after six years of studies by the national participation of the students in National Examination Classifying (ECN). The ranking of this competition enables them to choose a therapeutic field.

Therefore, besides those who possess medical knowledge to create the case and those who know how to build it numerically, those who control final evaluation of the students, also controls part of the »action's system«11 implied in the diffusion of the digital simulation in the initial training. It is the National Education Ministry which controls this uncertainty and which blocks the diffusion of this pedagogic innovation. It is them which it will be necessary to convince of this »point of required passage«(PPO)22. However, paradoxically, the Authorities of Health push the university hospitals to be equipped with simulation centres to prepare doctors with their »first time« in front of a patient and to strengthen medical training. But to reduce correction time and also costs, they preferred evaluate student with QCM which is far from the clinical reality and don't allowed an efficiently training.

Indeed, institutions find it particularly important to have simulation tools which reproduce »real« life situations. Virtual scenarios close to the clinical reality of doctors would support an »active« training as well as real practice. Therefore, the platform that is able »to mime« clinical reality as well as possible seems to carry a consequent advantage with respect to its competitors and to obtain a form of monopoly for the training and the intermediate evaluation before ECN. Which leads us to question: what exactly is this clinical reality that needs to be reproduced by the simulation tools?

A clinical reality toughly to reproduce by a machine

Medicine in the 21th century represents a multi-field profession which requires a great flexibility and openmindedness to deal with their patients correctly. The practice of the doctor in »clinical reality« is built as an »experiment« during which health professionals must solve enigmas. According to the presented medical records, symptoms described by patients or discovered during clinical examination, are the basis upon which doctors work out a diagnosis and propose a follow-up. In this purpose,

they must learn how to deal with patients, as it is written in the books of medicine, like in the institutional »good practices«. However, if the medical practice rests on tallied algorithms, within clinical reasoning, some uncertainties can appear, depending on the biological and behavioural reactions of patients. Also, the doctors must, on theoretical »knowledge«, to complete that resulting from the clinical experiment. They could, then, propose an assumption of responsibility or to rectify it if he notes thereafter, that his medical care is insufficient, bad or ineffective on patients. Three actions seem also usual in the approach of an expert during a consultation: to inquire, to fail and to readjust. The virtual consultations, in this same logic of trial and error propose to teach several cases in the form of decisional trees. The purpose is to subsequently visualize the consequences of actions. Students can then readjust themselves thereafter in the event of error which seems to reproduce dubious medical practice. The principle of training per »test-error« also exists in the progressive files proposed by the SIDES. But, they look like a short written synthesis without any interactive immersion while the graphic interface of PatientGenesys reproduces a consulting-room in three dimensions. Moreover, by a »free exploration« within the graphic interface, the interactive immersion suggested by the virtual consultations also seems close to the medical practice. Freedom exploration and test by trial and error, both, also stimulates the cognitive functions implied in the training[23]. A second asset, comparing to progressive files, comes from the conversational agent of PatientGenesys. This innovation permits doctors to write their own questions with the virtual patient and not to click among a set of pre-considered questions. They don't have a choice of pre-established sentences, which approaches even more clinical reality. Indeed, faced with a patient, they do not have choices of answers or questions as of QCMs. They must seek clinical signs to establish their diagnosis as an investigation. Therefore, PatientGenesys platform seems to bring an additional advantage in comparison to the clinical cases on paper or on SIDES platform.

In spite of its proximity with clinical reality, the digital tool can still appear rigid compared to »true« life. For example, the application indicates where to click in virtual medical examination thus giving away the purpose of the exercise. The application did not make it possible either to detect certain sensory and behavioural data. According to the teachers met, with regard to training of clinical reasoning associated with chronic diseases, this rigidity is not a trouble, especially for students already accustomed to QCMs. On the other hand, the platform is not ready yet for the training of »know-how«.

Nevertheless, by their playful aspect, they have another additional advantage to the progressive files of the SIDES, which is more »educational« than »game«. And the pleasure of a videogame is known to support the memory retention. Indeed, Fenouillet (2003)[24] distinguishes two types of motivations, the intrinsic motivation and the extrinsic motivation. The first indicates the attraction of the individual for the activity in itself. The second rather relates to the intention of the individual for the consequences of the activity in progress, which seems close to the individualistic methodology or strategic analysis we mentioned before. In the case of virtual consultations, the attraction for video games or new technologies can represent an intrinsic source of motivation while the success with the ECN would stimulate the extrinsic one. This phenomenon can appear if a sufficient bank of clinical cases exists, available on the platform and encompassing different methods of examination. Instead of »motivation«, we prefer to talk of personal interest. For us, the motivation is connected with a convenient challenge of decision making, whether it is conscious or not, real or imaginary.

Conclusion

So what are »good reasons« (Boudon, 2003) for doctors to use digital simulation? It can escape student as well as physicians from a framework which they would consider too normative. It can also support an »active« training which they consider more effective because it is nearer to clinical reality. During continuous trainings, it is the interactivity of the exchanges between fellow-members, cumulated with the tool »tablet« which brings an overall user-friendliness to the formation. Thus, the technological and interactive attraction of the collective formation by simulation can constitute an important source of attraction for these collective training. Nevertheless, the trainer plays a central role in the process of learning which can even block the transmission of relevant information. It is also advisable to accompany them in this new method by training with the digital one, which can appear tiresome for the old generations.

Finally, the digital support brings an important symbolic dimension, the way in which teachers create cases, how students solve them and what recruitments pharmaceutical firms have for participants. Moreover, the speech of the Authorities of Health pushes the universities more and more to be turned to simulation tools. Consequently, all the universities should be equipped with a simulation centre in the years to come which could slow down the attraction and extrinsic motivation associated with novelty. In the coming decade, it would be interesting to follow the development of digital technologies used for medical training. For now, more evidence is needed to draw any comprehensive conclusions in this rapidly developing field of digital medical education technologies.

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C. Simonpietri

Population and Development Centre Laboratory, Institut of Research Development, Paris Descartes University, Sorbonne-Paris-Cité, 45 rue des Saints Pères, 75005, Paris.
e-mail : caroline.simonpietri@gmail.com

DIFUZIJSKI PROCES VIRTUALNIH KONZULTACIJA NA FRANCUSKOM MEDICINSKOM TRENINGU: SOCIJALNO-ANTROPOLOŠKI PRISTUP

S A Ž E T A K

Još uvijek u nastajanju, simulacijski alati, poput plastičnih ili ljudskih modela, čini se sve više i više koriste na francuskim medicinskim sveučilištima. Simulacija stavlja liječnika u situaciju, često u slučaju nužde. Oni također mogu razviti medicinske vještine, kroz praksu, bez ikakvih štetnih posljedica za pacijenta. Više od »aktivnog« treninga, ti alati omogućuju stjecanje »know-how-a«, ispred pacijenta kao s drugim skrbnicima. Oni također omogućuju nastavnicima da procijene kliničko rasuđivanje svojih učenika, prethodno predavani u knjigama ili predavanjima. Što je s virtualnim konzultacijama o digitalnoj podršci kao što je računalo ili tablet? Kakvo znanje može prenijeti ova vrsta simulacije? Što to može donijeti liječnicima? Kako ga koristiti? Koje su prepreke njegovoj difuziji u medicinskom obrazovanju? Da bismo odgovorili na ova pitanja, tijekom dvije godine provedeno je nekoliko studija promatranja sudionika u digitalnoj agenciji specijaliziranoj za stvaranje ozbiljnih igara za zdravstvenu zaštitu. U partnerstvu sa sveučilišnim Paris Descartesom, ovaj mješoviti pristup javnog i privatnog sektora pruža originalnu perspektivu » inovativnosti u izgradnji« platforme za stvaranje i pohranu virtualnih konzultacija za zdravstvene djelatnike. Stoga, u kvalitativnom, sveobuhvatnom i induktivnom pristupu, nudimo analizu difuzijskog procesa virtualnih konzultacija u medicinskom osposobljavanju, od izuma do njegovog prijema od strane krajnjih korisnika. U ovom članku detaljno opisujemo »socio-antropološki« pristup koji smo primijenili u srcu industrijskog sektora zapadne zemlje. Također predstavljamo promjene koje su se dogodile u francuskom medicinskom treningu na početku 21. stoljeća. Zatim, na temelju tih identificiranih promjena, opisujemo napetosti za korištenje virtualnih konzultacija kao pedagoškog alata, u Francuskoj.