PES and learning by serendipity, a response to contemporary ills

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A number of scientific studies are alerting us to the physical evolution of the new generations, and in particular to the large number of overweight children and the resurgence of allergy and asthma among them, which is raising questions.

Events such as viral epidemics, like COVID 19 for example, accentuate this observation.

At a time when we expect working people to work longer to balance the pension funds, has the legislator considered the arrival in working life of these generations of future adults who will have greater medical needs due to the problems outlined above? What about financing the health insurance fund?

Will these future workers be able to work and contribute?

There is an urgent need to get to grips with this issue and as a PE teacher I am making my small contribution at local level by doing everything I can to give children the desire to take part in physical activity and to gain the self-confidence to acquire the tools to manage their future physical lives.

My aim is to create an environment that is conducive to learning in PE (Physical Education and Sport), and this involves structural organisation of teaching, constant research into innovations, and close collaboration with all the local players (parents, local partners, doctors, etc.).

The work that I am presenting to you is the result of a constant concern to respond and provide solutions adapted to the different profiles of my students.

What I thrive on is well-being before, during and after lessons, which requires me to develop

It is not only the pupils' "self-esteem" but also "our self-esteem" within the class group, as well as the teacher's comfort in teaching. This three-pronged approach is often incompletely taken into account in various educational works, but also in the texts of our legislators.

To encourage learning, the right conditions must be created during the lesson.

My approach to teaching is based on a wide range of authors, but I would like to draw on 2 recent trends:

A- The latest advances made by Marcel LEBRUN :

Marcel LEBRUN of the University of LOUVAIN has summarised a number of educational science analyses (1):

"Theories and pedagogical methods for teaching and learning. What place for ICTE?

According to his research, in order to promote learning, 4 main points must be respected:

1- Inform students and ensure that they are able to inform themselves.

2- Motivating students and enabling them to motivate themselves.

3- Put students in a production situation.

4- The session should generate social interaction.

We can only manage this set if we give the pupils autonomy.
This led to the need for digital equipment:

- Computers, tablets, smartphones...

- Video projector, VPI (interactive video projector...)

This multiplication of informational tools makes it possible to adapt to the different ways in which students function and to allow greater autonomy by providing answers without being dependent on the teacher. We aim to break this dependency between students and teachers by creating the right conditions for learning by serendipity.

B- Research into the development of learning through serendipity :

According to Mickaël Gallais (2)

"The serendipitous is the person who knows how to "at a certain moment take advantage of unforeseen circumstances" and, above all, does not allow himself to be dominated by chance (a false synonym), says Danièle Bourcier, director of research at the CNRS and co-author of the first book on the subject in France.

Serendipity is a state of mind that should be cultivated in order to make discoveries, but it is often suppressed by researchers who do not want to be considered as "chance" researchers.

The other author of the book, Pek van Andel, a researcher in medical sciences at the University of Groningen (Netherlands), praises this approach: in his country, researchers are entitled to their own Friday to meditate and indulge in the delights of serendipity.

Pek van Andel and Dominique Bourcier, De la sérendipité. Leçons de l'inattendu, L'Act mem, 2008.

We will therefore define learning by serendipity as enabling students to take advantage of unforeseen circumstances, to analyse and understand them, and thus to avoid being dominated by chance.

"The true voyage of discovery is not about seeking out new landscapes, but about seeing with new eyes".

Marcel PROUST ("A la recherche du temps perdu")

"... to have new eyes, to learn to adapt and renew our gaze, wouldn't that also be a way of improving our quality of life?
recipes for innovation based on Serendipity".

Teaching methods vary according to the objectives sought

Following on from this theoretical information, here's how it's implemented in my PE lessons.

By way of introduction, I'd like to point out that after more than 20 years of teaching, I've noticed a drop in pupils' levels of concentration, memorisation and commitment to continuous effort.
The use of digital tools (to good effect) and a structural organisation of the course based on the pedagogical concepts seen above enabled me to solve this problem.
The development of digital workspaces (ENT) in schools has made it easier to share information with students.

I-Examples of flipped pedagogy in PE :

1- Creation of a 360° virtual tour of my school's gymnasium, enabling pupils to get to grips with the different areas and, in particular, the safety and operating rules.

Candy-shaped areas are interactive (Hotspots) so when students click on them, they have access to video tutorials showing how to install the equipment, manage security...

During the first few sessions, we go over discuss what most of them have seen before.

Vidéo Interactive proposant une visite Virtuelle à 360° du gymnase

2- Interactive slideshows on the school's website can be used to communicate information about the school. information and develop students' curiosity.

Here, in our example, before the cycle, we provide a slide show on orienteering on the school's website, so that students can take readings in the field with friends or family. This goes hand in hand with the problem of linking the map and the terrain.

As part of the Orienteering cycle, we also use BYOD (Bring Your Own Device), i.e. we offer volunteer pupils the opportunity to download an application from a 'store' for geocaching.

3- **Geocaching** is an activity that involves using GPS to search for or hide a container (called a "cache" or "geocache") in various locations around the world. A typical geocache consists of a small, waterproof, durable container with a record of visits and one or more
"These are usually knick-knacks of no real value.

It's a motivating way to get to grips with the environment we'll be encountering during our Orienteering sessions, and to work on the concepts of orientation.

The pupils introduce their parents to this activity and get together with their families at weekends to go geocaching. This year, we had some pupils who became "geocachers", i.e. they created a cache, constructed the enigma and its description. They were proud to present their geocache post during an orienteering session.
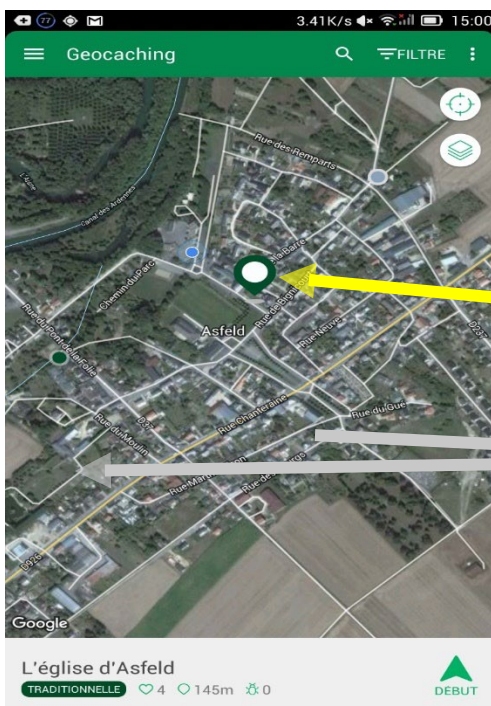
**Here's a screenshot of the general view, here around Asfeld college in the Ardennes.**

Our location.

3 covers.

We asked the students to download the Coach's Eye application.

4- **"Coach's eye"** is a tool that enables students to analyse their videos of physical performances in class. These videos are retrieved by the students (telephone, USB key, etc.) and then uploaded to the school's ENT. We then work on these analyses in class. The pupils have been trained to use "coach's eye" to observe themselves.
In fact, this tool makes it easy to visualise the physical performance and
annotate instructions: this encourages work based on social interaction.
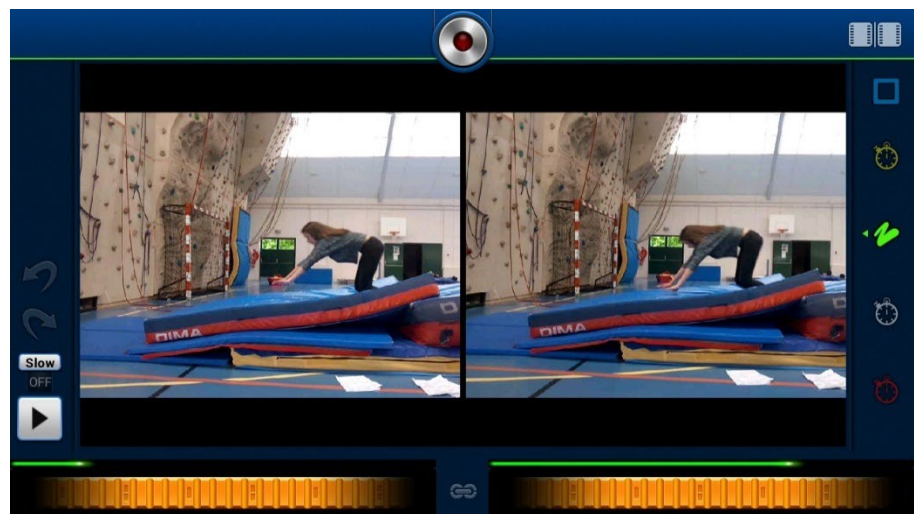
5- **Volunteer 3rd year students have the opportunity to create themed RPGs (Real Player Games) during lunchtime.**

They design their own games, but the main theme, texts and commentaries are chosen in consultation with the teacher.

We have productions on the rules for the various sports, the PSC1, dietetics, healthy living, etc.

When the RPGs are finished, they are available to all the school's pupils, who can play them at home and learn while having fun.

II- Differentiated teaching and learning by serendipity :

We've all experienced teaching situations that have interfered with our "teacher's zenitude", because we thought we'd been clear and explicit about the instructions we'd given, but faced with the incomprehension of some, and the incessant demand to repeat our instructions over and over again: that wasn't the case.

At the beginning of each lesson, when I give instructions, a student takes a tablet and records my instructions.

In this case, the aim is to give the students autonomy,

the teacher will not repeat this he's already said.

The aim is to combat the "help-seeking" mentality and force students to go through the process of looking for information. This little staging operation helps to lay the foundations for a lesson structure that will lead to learning by Serendipity. However, for

Then, if the student asks me for clarification about vocabulary or any other misunderstanding after reading the instructions on the video, I'm happy to discuss the subject with them. But then the approach is completely different, because a cognitive and information-gathering action has been generated.

This procedure frees me from a task and makes me more available for the class, which avoids creating irritation or annoyance that interferes with the teaching of the lesson.

I'm going to use different physical activities to apply these theories.
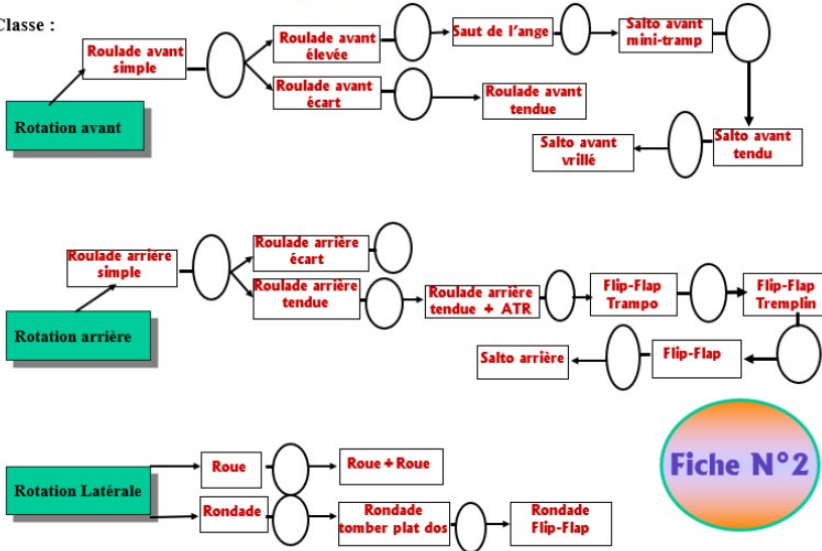
**In gymnastics**, the pupils have sheets with a progressive tree structure of gymnastic elements. Everyone can work and practise on the primary elements of the tree structure.

At different times during the lesson, I suggest assessing those who think they have achieved a level and if the assessment is positive, I sign the element on the sheet and the student can then work on the next element.

These sheets are also digitised, made interactive and displayed on computers during the course.
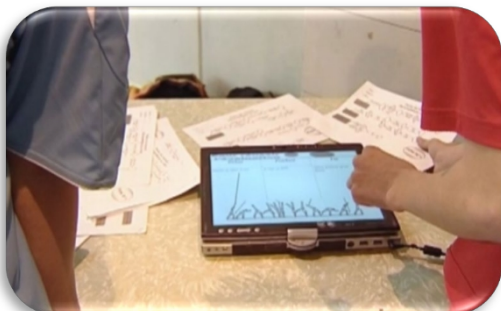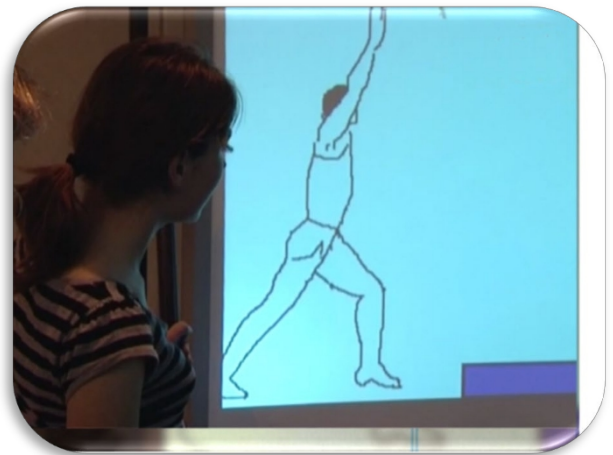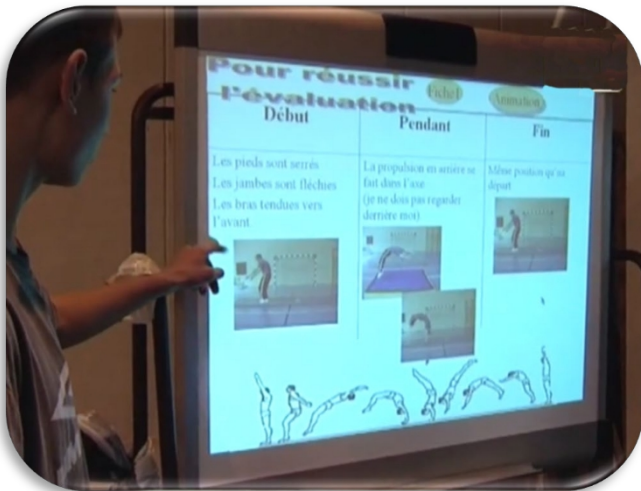

By clicking on an element, students will have access to different explanations (verbal, images, animations, videos, slow-motion videos) and can then, with the help of a classmate, practise the element by being observed and guided before, during or after its completion.

The same method is used **in climbing**, where the class has access to digital resources on the actions to be carried out, safety (knots, harnesses, etc.), motor skills, etc.

The aim is not for the teacher to save sessions on learning about safety, but to avoid having to repeat the same things every session and preventing the pupils from thinking.

After the first few sessions, the teacher will no longer accept problems with incorrectly put on harnesses or knots that are impossible to tie.

It will send students to other referral students and to the relevant digital resources.
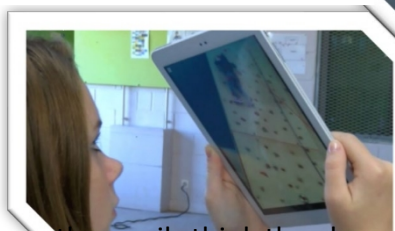
Once the pupils think they have succeeded in putting on their harness and tying their knot, they ask the teacher for validation. The time freed up for these tasks allows the teacher to be more available to develop the class's learning. The aim is to assist the pupils, but above all not to make them "assisted".

When I have to work on one part of the climbing wall to set up more difficult situations, I place fun and digital activities on another part of the wall which will involve part of the class and which will be carried out on bouldering work requiring less risk.

This also allows me to be available for students who need me to be physically present with them.

Here, the memory game focuses on the relationship between the climber and the observer (belayer).

The climber has to return pairs of images and the observer who has mastered the tablet has to validate them. The observer must give the climber as clear and precise information as possible to help him or her turn over as many pairs of images as possible. When the climber touches the ground, the game stops.

Here, shapes are projected onto the wall, which we've made interactive using a Wii remote control.
We call this wall SIE (Surface Interactive d'Escalade).
When the student clicks on the shape, it disappears and points are scored.

Here we have Léa, a 3ème pupil who is hemiplegic on her right side. His determination, motivation (here at the top of a 9m wall) and the organisation of PE lessons enable him to take part in all the activities offered to the class (Canoeing, Wrestling, Step, Climbing, Golf).

Another way of facilitating the inclusion of all pupils is to teach **innovative activities** such as golf, where physical strength is not an advantage without technical mastery.

On the left, we have our golf clubs and underneath we have a synthetic golf green that we made with the help of parents and pupils from the school.

We have invested in all-terrain scooters to enable pupils with motor difficulties to keep up with the group (middle-distance running sessions, access to the woods for orienteering, etc.).

Let's take the example of the wrestling activity in my school's sports association:

In my wrestling AS, the public is mixed, the students are numerous and the heterogeneous levels, which leads to specific and different needs.
ICTE enables me to make students more independent because they can learn how to use them and identify the needs they meet.

There are around twenty participants aged between 12 and 16, with almost as many girls as boys. We have taken part in the French championships several times with this AS, which is made up of pupils who were not familiar with the activity when they arrived in the 6th form, and without a support club to back us up in the villages where the school is located.
Activity treatment based on biomechanical analysis of movement using video a s a tool to enable all students to express themselves freely in different roles (referee, coach, fighter). This enabled me to achieve a podium finish in the French championship with a women's team.

For example, I use ICT to present wrestling, to raise awareness of it and, above all, to differentiate it from other combat sports.

At first, students and parents alike were unfamiliar with this activity, because although wrestling is not confused with judo, it is often confused with wrestling. At the beginning, the parents asked me about this activity (risks, mixed training, etc.), so it reassured the most inhibited but also calmed down the most reckless.

I show videos of pupils and adults in order to provide a social representation of the activity at all ages and levels so that parents and pupils can project themselves.

We use the Youth Wrestling rules: simplified wrestling rules that do not distort the activity but make it more accessible and easily understandable for wrestlers while encouraging the training of young officials.

Wrestling is very different from boxing (a striking activity in which the face is the target) because it is a gripping activity in which, in the "brought to the ground" phase, you don't have to throw your opponent (unlike in wrestling) but you do have to accompany his fall.
The attacker does not score if he has dropped his opponent.

I also use videos at my school's Open Days and at parent-teacher meetings. It's an effective way of communicating with young people and parents alike.

My AS is like a beehive: there's always a power point, videos, phones or tablets, cameras for filming and a video projector, but I don't use everything for everyone or all the time. I use them according to the needs of the groups, the skills, the levels...

The use of several different media for any information given to students (text, image, video and demonstration) is a guarantee of good understanding.

When I show videos, I use the "Coach'seye" application and the "miracast" system which allows video to be sent wirelessly from any phone or tablet to a video projector.
This means that everyone can see the images on the big screen and the video can be manipulated in order to
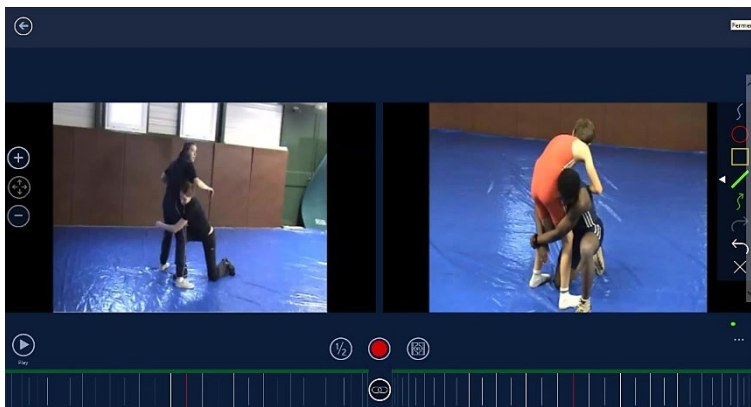
highlight certain actions: I play the images, I stop, I go back, several viewings, etc.

This application features a 'scroll' function that allows you to scroll through the video frame by frame, as it is very difficult even for a fairly expert teacher to spot the interesting elements during a fight.

It also allows two videos to be viewed side by side to compare two performances, and the student can instantly add an audio commentary when analysing the video.

Make what has been done objective:

The first use of the video is to show the pupils what they have done. As adults' words don't always carry much weight, this video makes them visible and 'true' to what has been done.

Pupils may also find it difficult to explain, demonstrate or reproduce what they have done.

Explain the criteria for performing a technique:

For example, holding on to your opponent keeps you balanced, but not letting go also allows you to become an attacker when the defender finds himself on top after the fall and is able to outmanoeuvre his opponent by using his strength.

The action moves quickly and the question of tempo is paramount: the slow-motion video can be found here all its necessity.

Then I ask: "What did Arthur grasp?", "Is he the one who created the imbalance?".
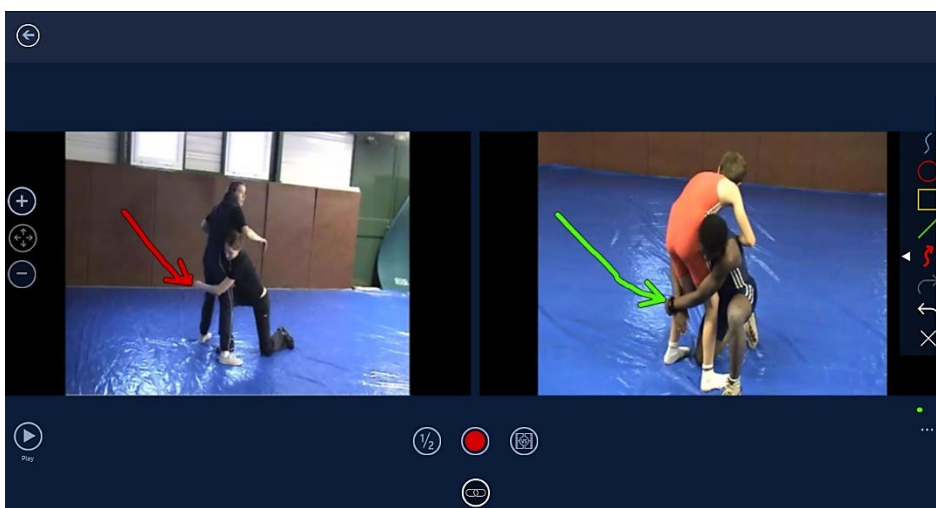
We look at the images again and the application allows us to draw arrows and axes to understand and explain the direction of the imbalance. The action is analysed in great detail.

This makes it possible to formalise the precise criteria for overcoming your opponent during the fall:

• Grab your opponent and lean on him.
• Move your centre of gravity closer to your opponent's.

• Build up the right tempo to accelerate the fall generated by the opponent in order to reverse the imbalance to my advantage.
Working with video, combined with a reflexive identification of sensations, makes it possible to learn things that might seem too complex in a school environment, but which are made possible in these conditions.

Explain the sequence of actions:
The pupils start again with a new situation, the aim of which is to relate the sense of the imbalance and the choice of effective action it allows. Beginners are often at a disadvantage.
For example, if the opponent pushes me, I have to step back and use a body shape that goes with the generated imbalance. Once again, we use the video to observe and understand, because in action it's difficult for the students to stand back from their actions.

Observe an opponent to develop your own strategy :
Before challenging someone, the fighter films another fight and watches the video.

It is clear that PE is a discipline where motor involvement is very important, which is its DNA. As technology and students evolve, we have to constantly question ourselves to ensure that our teaching evolves.
Digital technology and all the existing tools will only be able to bring real added value t o learning if we are able to transform them into "teaching tools".

The use o f digital tools is interesting but should not be the only one. I also use sophrology and relaxation, and above all I try to create a climate that is conducive to learning. The aim is to give children the desire to take part in physical activity, to gain self-confidence and to contribute to their development as well-balanced future citizens.

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