

How modern technology can assist learning Tae Kwon Do, events, administration and management

Tae Kwon Do is a relatively new art or sport. Although it contains many elements from other more ancient arts, Tae Kwon Do as we know it today was only officially named on April 11 1955. As such, I believe that there are many facets that can bring this already modern sport further into the 21st century, in ways which can build upon and improve an individual's training experience, as well as the organisation as a whole.

I will aim to explore the many aspects in which modern technology, in one form or another, whether it be hardware or software, has already benefited Tae Kwon Do and how the use of certain technologies can be extended even further to better assist students, competitors, instructors, and everyone else involved with Tae Kwon Do.

I would like to start by detailing exactly how much progress has been made in terms of watching and reviewing current and past practitioners and how that process can assist future generations of students by allowing them an alternative aspect, containing instant and detailed scenes which may be used as an additional learning tool.

One example of this is how technology can provide a better viewing experience for watching a live tournament by granting the ability to stream events in real time over the internet. This was achieved well at the last World Championships in Italy in May 2015. People from all around the world were able to watch rings 1-4 and 5-8 simultaneously, thus enabling families, friends and spectators to view the tournament live in real time, just as those that were present at the event.

The viewing experience is also augmented by the introduction of large High Definition displays. These allow a much larger and clearer view than ever before, the next best thing to actually being there.

High Definition defines the number of pixels, or 'dots' that make up a picture. Older conventional televisions were known as CRT or Cathode Ray Tube TV's and were generally Standard Definition which was commonly made up of 768 x 576 pixels in New Zealand. This basically means that the width is 768 pixels and the height is 576 pixels.

High Definition refers to anything that is higher than Standard Definition. The two most common standards in New Zealand are 1280 x 720 and 1920 x 1080.

1920 x 1080, commonly known as simply 1080 or 1080p (*the suffix "p" stands for progressive scan*) has quickly become the most common standard in New Zealand and overseas and is the default resolution of most television sets today. This provides approximately 2 megapixels, which consists of "2.07 million" pixels or 'dots' on the screen.

There is a new format however, which is quickly emerging and looks set to become the new standard which is known as Ultra High Definition or UHD. This consists generally of 2 different

resolutions; 4K which is currently the most popular UHD resolution and is 3840 x 2160 pixels or approximately 8 megapixels (8.29 million pixels), which is four times the resolution of 1080p.

8K is the other emerging standard which hasn't quite seen the recent popularity of 4K. 8K resolution is 7680 x 4320, which is approximately 33 megapixels (33.18 million pixels), 16 times the resolution of 1080p.

There are also a lot of other factors to take into consideration, although resolution is arguably the most important factor. Some of the other factors which are also important when it comes to display include but are not limited to the following:

Pixel Aspect Ratio - a mathematical ratio that describes how the width of a pixel in a digital image compares to the height of that pixel.

Refresh Rate - the number of frames per second that a monitor or television can display. It is measured in Hertz, which is equal to 1/second. E.g. 120Hz means it can draw 120 images per second.

Interlaced Scan – Used by traditional, older television sets, where half the picture is drawn on the display at a time. The other half of the picture follows 1/60th of second later.

Progressive Scan – Used in newer displays as an alternative to Interlacing, where the entire picture is drawn at once, which eliminates the flickering that is noticeable on older displays.

With today's modern flat panels being able to display so much detail, features that would have otherwise been missed or gone unnoticed previously are now able to be observed by the viewer in such clarity that watching Tae Kwon Do or any sport is no longer the questionable, blurry practice that it was once was. This is especially important for those watching for learning purposes as they are able to freeze individual frames or zoom in with precision.

Websites are another great technological tool that can be used by local Tae Kwon Do clubs to convey information to potential new members as well as current members. For example, listing upcoming events or displaying results, photos and videos from grading's and tournaments.

I created and maintain the website for my own club so I have a reasonable appreciation for what is involved and how much time is encompassed in the design, creation and ongoing maintenance of a website, however I believe it is an essential tool for all Tae Kwon Do clubs.

Furthermore, I consider websites to be even more important for regions, national and international bodies to share information and news.

The iTKD website (www.itkd.co.nz) is a great example of how information can be shared with all its New Zealand members.

The following is a brief overview of what information is encompassed within the International Tae Kwon Do website. It consists of but is not limited to the following:

- Overview of Tae Kwon Do and the organisation, both internationally and in New Zealand
- People of importance, historically and presently as well as awards people have been recognised for
- Information on how to join and details of all clubs within New Zealand
- News and updates
- Calendar of events as well as detailed information on past and present events such as tournaments, grading's, courses and camps

- Information on the High Performance team and the World Championships
- Links to merchandise and approved retailers
- Reference section containing essays and articles written by other Tae Kwon Do students and a document library containing official documents, policies, papers and other documentation
- Governance section containing public documents for members, sponsors and other stakeholders to access
- Information for parents, caregivers and children
- Links to other related external national and international websites
- Contact information
- Full database containing club and student information for instructors
- Information page for students containing training history and details such rank, qualifications and attendance dates for courses
- Black belt only section and forum
- Tournament entry forms
- Online tournament publication forms, including ability to create and print draws and divisions
- Black belt grading application form

The International Tae Kwon Do website, in my opinion, is a fantastic resource with an immense amount of material and instruction and is an invaluable tool for the New Zealand organisation, without which would leave a huge support and knowledge gap.

The online tournament software is another area where I believe technology really excels and has had a significant impact on the preparation time that goes into organising and running a tournament as well as management and the composition of draws.

As a recent user of the online tournament software, I can imagine how much more time consuming it would be to have to complete the automated tasks manually. I do believe that there is some room for improvement still in this area, however I also understand that those involved with the creation and maintenance of the software likely donate their time and I can appreciate the amount of work and effort that must go on behind the scenes, for which I applaud their endeavour and achievement.

The introduction of Electronic scoring at tournaments is another area in which technology has made a great contribution to Tae Kwon Do. I have not used it myself but I have seen it in action at the National Championships and also on the live web streams of international tournaments. Although this isn't something I have a great deal of knowledge on, I can appreciate the improved efficiency involved in scoring as a corner judge, as well as the automated collation of points and the overall result at the end of each bout.

Another area that has seen a large increase in acceptance and popularity over the last few years is social media. Sites such as Facebook and Google+ allow both instructors and students to share information in real time as well as live instant messaging with other members. Events may be established, and members invited to attend, allowing the author or authors to track who is planning to be present, reminding attendees of the pending event, as well as allowing all parties involved to contribute and observe material relative to the occasion.

The advance of digital cameras is yet another illustration of how technology can assist Tae Kwon Do. Cameras can be used to take still images or capture video, which can be used as an additional learning tool. Photos or videos can be taken for students to review and use the resulting output as an opportunity to identify what can be improved on. Examples may include patterns, helping

students to observe their own techniques and ensure that their stances are correct, their attacking and blocking tools are being used efficiently and correctly, ensuring that they are producing efficient sign-wave and that they are stepping and crossing correctly.

Camera's may also be used at tournaments, particularly in sparring bouts and reviewed post-match to potentially examine students' strengths and weaknesses and assist with their development.

Perhaps one day video may be another tool that referee's and umpires employ to determine points that may have otherwise gone unobserved, similar to how video referees are used in international rugby matches today.

Video may also be used as a tool to remember certain sequences, such as pre-arranged sparring. I have found this extremely useful myself in preparing for grading to 3rd Dan as I have been able to determine certain sequences with a partner at training, have someone record it, and review it later in order to recall what was practised.

Another helpful tool is the invention of Smart tracking devices. These are a relatively new tool, which encompass devices such as smart watches, GPS trackers and heart rate monitors. These can be extremely useful when training outside the Dojang, especially when running or testing fitness, which is a requirement for all Dan grading's. They can be used to map run distances and times, which set a baseline for which can be improved on and measure heartrate during fitness activities, which may be implemented in different ways. Again, first a baseline may be set for which to try to improve upon while encompassing any one of the many disparate approaches. Examples may include trying to raise heart rate while exercising or by comparing how long it takes the resting heart rate to return, which is generally a good indicator of fitness.

Finally, the internet in general is a modern achievement in which can be used to share information and communicate in many different ways. This distribution of information is invaluable when it comes to learning anything, but especially an art such as Tae Kwon Do. Information can be easily sought by students, such as webpages or documents containing pattern information including detailed meanings and history, articles containing nutritional information, as well as video sharing sites such as YouTube that show internationally recognised athletes performing exercises such as patterns.

I have outlined the many ways in which modern technology can assist Tae Kwon Do in a broad sense, as well as numerous examples of the individual ways it can assist and improve in specific manners. I believe that practitioners of Tae Kwon Do and other sports have a better chance of success with the aid of the wide variety of technological tools that are presently at their disposal, as are the clubs and associated members as well as the organisation as a whole.

I envisage that the future success of Tae Kwon Do will be somewhat dependant on those responsible for its growth and development, adapting as technology changes and adopting any new tools and advances as they become available, and that is hopefully apparent from this article, based on the evidence presented and views expressed within it.

References – Wikipedia, itkd.co.nz, dummies.com