

## Dashboard for wellness and SPE recording

In most of the course we have focused on the analysis of data provided by technological tools and devices: force platforms, accelerometers or GPS devices. These tools, although increasingly affordable for organizations at different levels, involve an economic cost of entry and may not be available to all professionals. Although we have shared sample data and provided resources to work with specific sports performance data, we may need to work with data that is specific to our context and, with the analyses highlighted during the course, make decisions in our day-to-day lives. There are multiple resources to collect athletes' information which enable us to work with this data without incurring on any cost or economic investment.

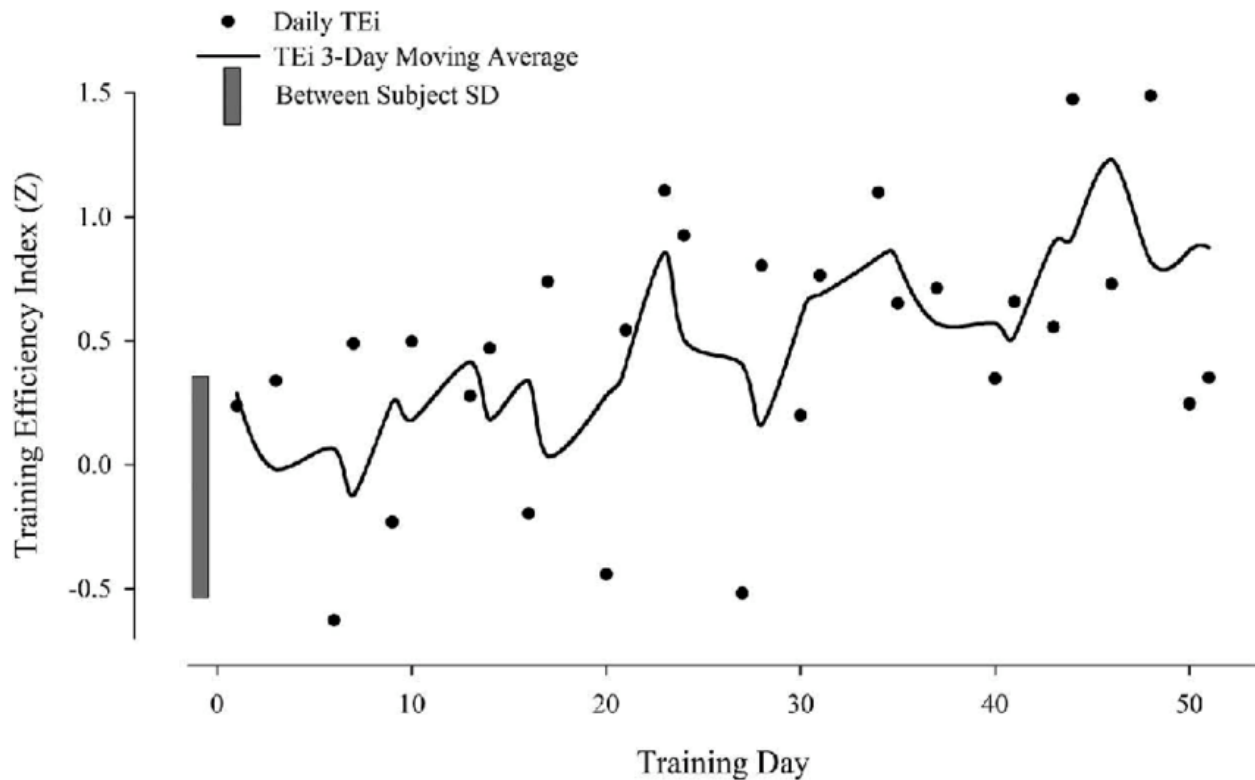
We can manually collect information about the injury history of our players, their participation in training sessions and matches, etc. There are also specific questionnaires that allow us to get information on the player's load and, therefore, have indicate the player's performance during training and competition. We are referring to the subjective perception of effort (SPE). A questionnaire that allows the training requirement to be assessed on a numerical scale from 1 to 10. This measure is related to other indicators of internal load such as heart rate or blood lactate (Coutts et al., 2009). With a simple measurement at the end of a training session, we can get daily data that reflects training intensity. If we add to this data the measurement of the duration of the session or match as volume information, we get a more robust data on the total load of the player at a daily level. Although it is not an objective measurement like heart rate and GPS data, it is a validated assessment and, therefore, useful for decision-making based on it.

The use of SPE as an internal load indicator is widespread in the field of sports performance and the incorporation of internal load information within the load control and training response process allows a "piece of the monitoring cycle puzzle" to be added. A player's internal load in response to an external load changes depending on the player's physical condition (Lima-Alves et al., 2021), which reports on the way the player is responding to training stimuli. This has medium- to long-term applications, analysing changes in the player's internal charge response (SPE) when subjected to multiple external load stimuli of the same characteristics.

There are also methods that combine external and internal load in the same value (called training efficiency index), which provide information on the volume of training and the players' response. These indicators inform on the physiological adaptations that occur as a result of training (Delaney et al., 2018). In the same way that this index provides information about training adaptations, we can also detect when the player is not responding to training stimuli as expected and may be fatigued.

### Figure 1: Examples of changes in the training efficiency index

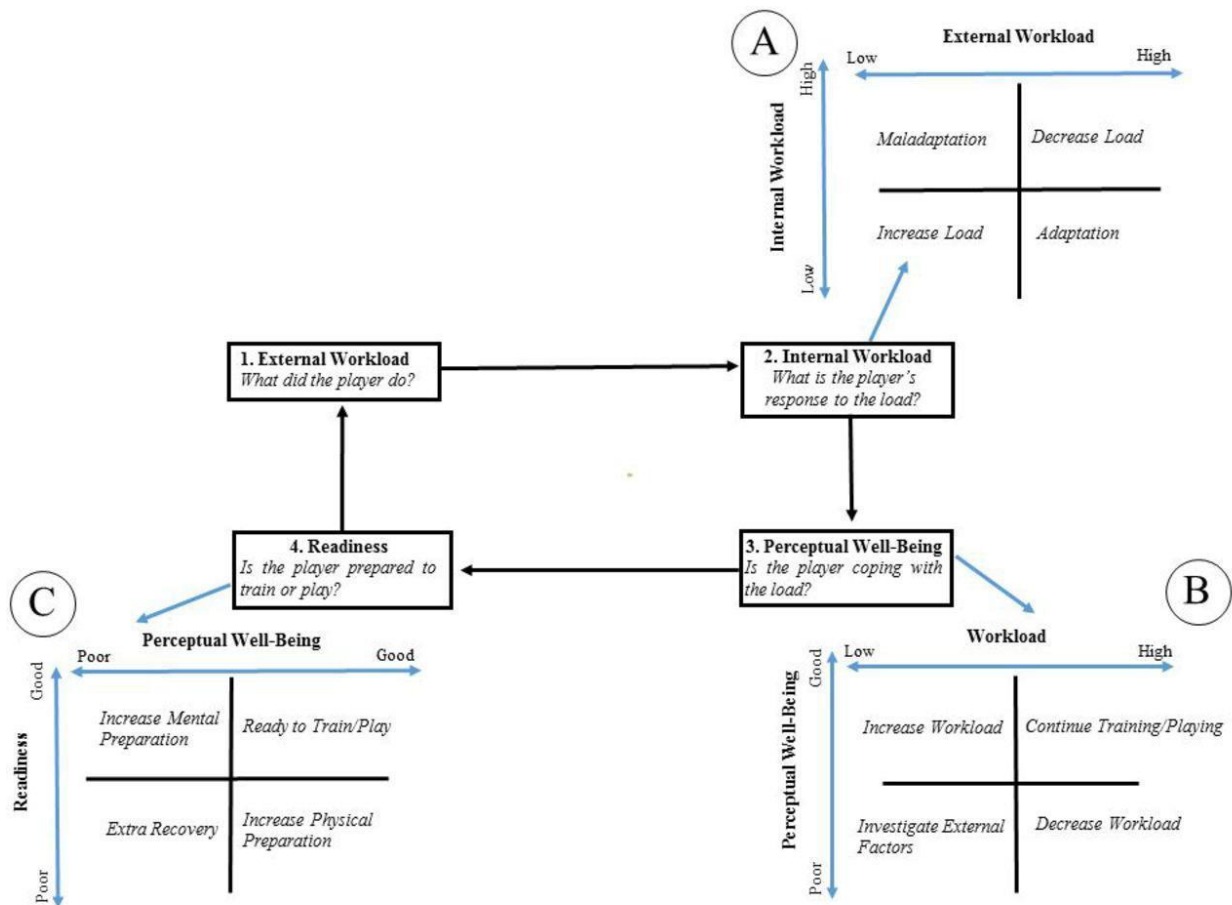




Source: Delaney et al., 2018, p. 4.

We have already mentioned the concept of the *monitoring cycle* and to refer to this process, we may look at the work of Gabbett et al. (2017) in which they propose a practical guide to incorporating multiple sources of information to make decisions about athletes' state of preparation, adaptation and load. In this proposal, they selected multiple data sources which provide information on different aspects of the player's state. This "cycle" is represented in the figure below. As can be seen, the structure of the proposal is based on following a series of steps to make decisions. We start with the analysis of the external load, answering the question "What has the player done?", a question that we have seen in other modules of this course using external load data such as GPS to respond to it. Next, there is a step that describes the need to use the internal load that we mentioned at the beginning of this text. When compared with the external load, this step allows us to determine what the player's possible state of adaptation is and, once defined, determine whether we should increase, reduce or maintain the load to achieve the proposed objectives.

**Figure 2: The athlete's follow-up cycle**

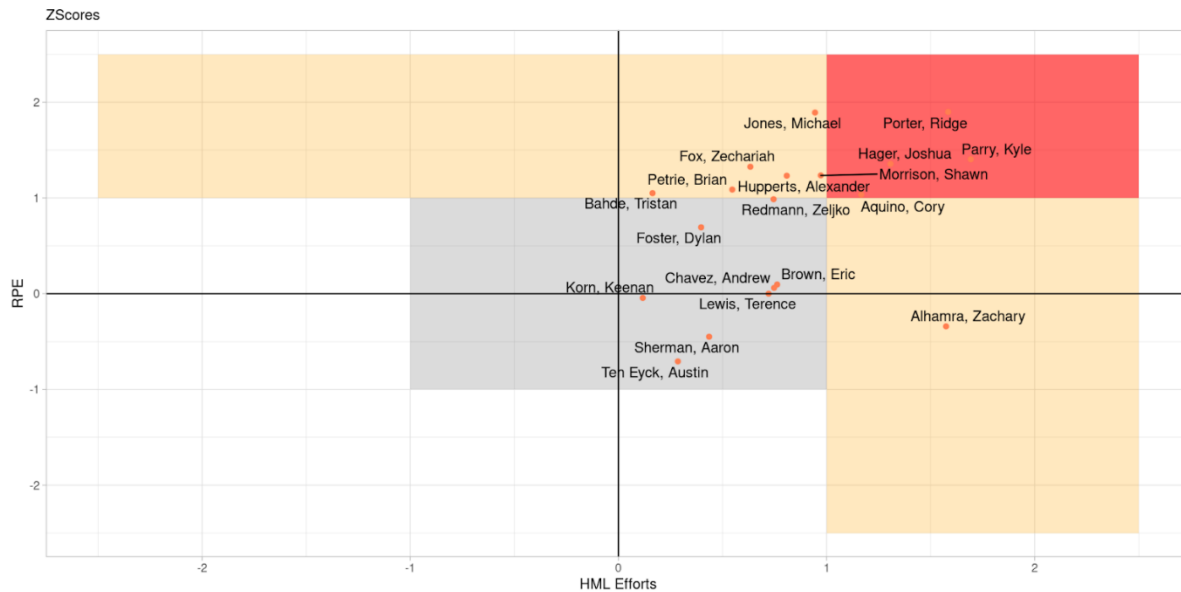


Source: Gabbett et al., 2017, p. 1452.

In the example below, the proposal has been adapted to a particular team, in addition z-scores have been used in both variables (internal load and external load) to take into account each player's variability, as we also saw in other modules of the course. With this information we can answer the question posed in the proposal: "how has the player responded to the external load posed?"

Figure 3: Example of the proposal adapted to a particular team





Source: Author's own production.

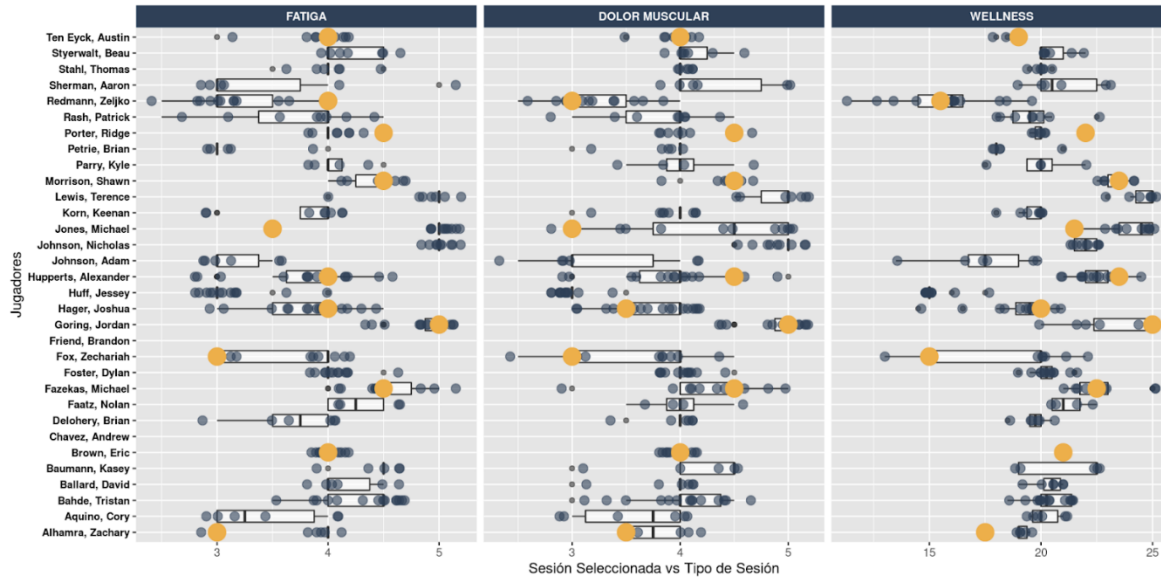
The third step refers to the player's well-being - this element is considered important to determine whether the player is tolerating the training load. It refers to questionnaires that gather information about the player's perception of their state of fatigue or tiredness, also called wellness questionnaires. These are psychological questionnaires that aim to measure player fatigue, sleep quality, muscle soreness, stress levels, and mood. The player evaluates each of these items on a scale of 1-5 and the values are added up to get a total score on the player's well-being (McLean et al., 2010).

The changes in the scores of these questionnaires have been associated with changes in training load in the short and long term, as well as results that reflect greater well-being when carrying out phases of load reduction (Saw et al., 2016). If these values are to be incorporated into the daily monitoring cycle, as described in the previous proposal, these results have also been shown to be valid to follow the recovery process throughout the week after matches for team sports players (McLean et al., 2010).

In the following figure, there is an example of how to use the results of the wellness questionnaire in the same way. The distribution of the player's usual values is used as a reference and, in yellow, there is the specific result of the day to be analysed. In this way, we can determine what the player's perception of well-being has been after the previous day's load.

**Figure 4: How to use the results of the wellness questionnaire**





Source: Author's own production.

The last point refers to the player's state of preparation, which will determine their participation in the training or match; although subjective questionnaires can be used on this step, metrics that provide us with information on this aspect are usually used. We saw some of the possibilities offered by force platforms to assess this aspect in previous courses.

### Application of questionnaires in the sports field

These examples aim to highlight the importance of incorporating this subjective information as a Sport Scientist, especially if there are no resources available to incorporate other technologies in your context. Even so, although they are tools within the reach of any professional, there are a series of considerations which we will describe below.

- **Impact:** We should use this information if we believe it will add value to the decision-making process. On many occasions, it is difficult to convince players to answer questionnaires on a daily basis. We need to inform players of the importance of this information and, to some extent, make them aware of the decisions that are being made with these resources.
- **Consistency:** as we highlighted in previous courses, we need to have a plan for collecting this data throughout the season, as well as ensuring that conditions are as similar as possible when we record this information. The scientific literature is full of information on the methods to achieve this.
- **Viability/efficiency:** this will be the objective pursued by the video material: to use RStudio to create a tool that allows us to record this information in a simple and efficient



way. Also, it is also an objective to access it in order to incorporate it into the monitoring cycle.



## References

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