Feature

INTEGRATED LEARNING IN SPORTS ANALYSIS

Hayden Croft

This article is based on a keynote speech given to the High Performance Sport Symposium, 20 October 2017, Otago Polytechnic. Hayden Croft is a Senior Lecturer and Consultant at Otago Polytechnic's Institute of Sport & Adventure. Correspondence: hayden.croft@op.ac.nz

INTRODUCTION: What is intergated learning?

The AKO Aotearoa website has this to say about work-integrated learning: "time spent in the workplace forms an integrated part of an academic program of study." Although this is a complex way to teach, it provides superior 'ecological validity' to a program compared with the traditional classroom-based lecture. In the past, it was more common to train in an apprenticeship scheme than it is today, with many professions now being taught in theory-based courses completely detached from practical skills-based learning. However, there are many benefits to an integrated learning approach, as Figure 1 illustrates. If properly managed by the lecturer, a placement can provide a place to learn, generate income, provide a platform for research and also engage industry in positive ways.



Figure 1. Integrated learning can have many benefits, not just per se.

Industry Engagement

Industry engagement is important as it builds the reputation of one's department, institution and staff, while giving the students an opportunity to impress employers, gain experience and learn the professional skills that can't be learnt from a textbook, such as communication, timelines and deadlines, and group dynamics. If we are preparing our students to work in industry, then how can we *not* have a strong working relationship with industry?

The sports analysis branch within the department of Physical Activity & Wellbeing [correct?] at Otago Polytechnic

currently works closely with organisations such as Otago Rugby, Southern Steel Netball, Highlanders Rugby, Tonga Rugby, Football South and NZ Rugby, as well as equipment and software providers like HudITM, Tarn GroupTM, SASTM and GPSportsTM. This keeps us up to date with what is new, what employers need, the skill that industry needs in our field and where the opportunities for employment lie.



Figure 2. Industry partners' logos line the walls of a learning space at Otago Polytechnic Photo Credit. Hayden Croft

Placement

In a sports analysis programme, it would be very easy to send the students to hold cameras and provide simple video reels for the team concerned. However, this type of placement lacks depth and the students very quickly feel as though they are being exploited as cheap labour. Rather, the types of placements we engage our students in comprise the main 'pillars' of sports analysis. These include various forms of video technology and techniques; other technologies such as GPS and accelerometers; and data analysis and game statistics, as well as broader performance profiling and technique analysis.

These skills sets are most evident in placements such as those involving the Southern Steel netball analysis team and the Otago Rugby Mitre10 Cup campaign. With the Southern Steel, a group of five students work filming and coding training sessions, producing opposition analysis reports and live game plan statistics and beaming them to the coaches' bench during the game. While this is happening, other students are capturing video and statistics which then are shared with the players post-match on a platform call HudITM. This helps both players and coaches reflect on the performance and speeds up the debrief process, enabling preparation for the next match to begin earlier in the week.

These placements accelerate the students' learning, as there are real outcomes from their work that contribute to winning and losing. This process is managed carefully by staff who communicate with the coaches, check the quality of work completed and ensure that deadlines are met, even if this means doing the work themselves. Effective, frequent communication and a supportive approach are crucial to making sure the team works well.

Every season teaching is very 'hands-on' from the outset, with the staff leading most aspects of the analysis process; as the season progresses, the students begin to lead and take over when they are confident and capable. This means that the learning involved tends to begin in a very explicit and technical manner and then transitions to become more implicit and professionally focused. Learning outcomes in the courses in which the same students are enrolled also follow this pattern.



Figure 3. Otago Polytechnic sports analysis staff and students with coaches from the Southern Steel netball team, postmatch. Photo Credit. Hayden Croft

The fee-for-service model

As staff and subsequently students have skills that are of value, I feel it's important to make sure that industry pays either in-kind or fiscally for them. Devaluing these services, by providing them for free, teaches industry that sports analysis is of little value and thus shouldn't be paid for. There are two scenarios that can be applied to our "fee-for-service" contracts. The first is that when a sports body or team has staff in place who can train, educate and guide the students during their placement, then this is considered in-kind payment and both the students and team benefit. The second scenario arises when the sports team or body involved lacks the skills to train, educate and mentor the students; in such cases a fee is negotiated that offsets the cost of lecturer time, equipment and facilities. The team then receives a high-quality service in which the lecturers and students work together to provide cutting-edge sports analysis.

A consequence of the fee-for-service approach is that some of the fees remitted contribute to the purchasing of new technologies, equipment and software that can in turn be used across a variety of fee-for-service contracts. This gives sports departments access to equipment that they could not normally afford within the sports analysis budget.



Figure 4. Students operating an expensive sports analysis video mast and computer software, during an Otago Rugby team training session at Forsyth Barr indoor stadium, Dunedin. Photo Credit. Hayden Parsons- Otago Polytechnic

RESEARCH

While applied research is sometimes seen as difficult, it provides some of the most valid and information-rich findings for practitioners and students alike. Sports analysis staff at Otago Polytechnic are active in researching and publishing their work and in solving problems for industry. Studies conducted include observing and analysing rugby team environments and the application of analysis processes in team meetings (Middlemas & Croft, 2016). Another study has developed new camera technologies that allow first-person perspectives during training (Croft, Suwarganda & Omar, 2013). Two further studies have applied very technical data analysis techniques to compressing and analysing large rugby data sets (Croft, Lamb & Middlemas, 2015; Lamb & Croft, 2016) which can then be used by teams in preparing for matches. A study has also been published which helps netball teams visualise large data sets during games in a way that informs them how their game plan is progressing (Croft, Lamb & Wilcox, 2016).

For research to be effectively integrated into industry it needs to solve problems that currently face industry, does not adversely affect how the team functions, and is well planned so that any ethical issues involved can be attended to during the off-season. Publishing research results in a timely manner is also important, as it shows industry that their contribution is being utilised and is valuable.

Student research also works well in industry as the students can conduct small-scale and quickly completed research projects that can solve problem in-season for the team. The key is to make sure that the students follow an action research approach which is minimally constrained by process and methodologies.

Assessments and Qulifications

There are two methods used to integrate industry with the assessments and qualifications taught in our department. The first is to use assessments that are based on processes that are relevant to the role of the sports analyst, while the setting or topic should be flexible enough to let the student use their assessment learning in whatever placement they choose. We have found that coaches and athletes are always willing to be interviewed or give students feedback about their work – this may be a product of their seeing value in what the students provide. Examples of assessments that align well with the sports analysis profession are: "Design an analysis environment" and "Problem-solving/needs analysis project." Both of these topics were recommendations from industry during the curriculum development process.

The second way in which we align assessment and qualifications with industry is to align learning with accreditations such as ISPAS (International Society of Performance Analysis of Sport) levels 1 and 2. As the year progresses, students accumulate learning and evidence which enables them to achieve at least a level 1 ISPAS accreditation. This means that when they apply for employment they have external qualifications, in addition to their Otago Polytechnic graduate diploma, and they are also part of an institution which can support them with direction on further professional development. ISPAS also hold annual conferences and workshops that provide valuable updates on the latest research and practice in the sport analysis field.



Figure 5. The ISPAS accreditation pathway which each student works towards while studying. Permission to reprint obtained from International Society of Performance Analysis of Sport

Graduate Outcomes

A colleague from another field once asked me: "Having cool stuff doesn't get jobs for students – are there actually paying sports analysis jobs out there?" He was makings a very good point. The only way we can be sure of this is to collect evidence from each year's alumni. As of 2017, of all graduates who specialised in performance analysis 67% are in paid employment with either sports teams or companies which provide sports analysis, while a further 17% volunteer their time, doing analysis for age-group or club teams. The final 16% are in other employment or travelling the world. This said, all of these graduates are on the career ladder and, as the industry grows, like everything related to high-performance sport, they should be in influential positions in ten years from now. It is also hoped that some will carry on to higher level study and help grow the academic base in New Zealand and overseas for this exciting field of practice and research.



Figure 6. Students enjoying the scenery before a 2016 Mitre 10 Cup Rugby match. Photo Credit. Hayden Croft

Hayden Croft is a senior lecturer at Otago Polytechnic and a performance analyst with Otago Rugby and Southern Steel Netball. His research interests include sports analysis, biomechanics and video technology. Croft has a Master of Physical Education (Biomechanics) from the University of Otago and is currently working toward his PhD at AUT in New Zealand.

REFERENCES

Croft, H., and Middlemas, S. (2014) Evaluation of first-person (head-camera) vs. third-person perspective video feedback for decision making training in rugby sport. World Congress of Performance Analysis in Sport X, Croatia, September 2014.

Croft, H., Kardin Suwarganda, E., & Faris Syed Omar, S. (2013) Development and application of a live transmitting player-mounted head camera. *Journal of Sports Technology*. http://www.tandfonline.com/doi/full/10.1080/19346182.2 013.816719#.UhVDCLGN2t8

Croft,H., Middlemas, S., & Lamb, P. (2015) An application of self-organizing maps to rugby performance analysis information. *Journal of Performance Analysis* (December 2015).

Lamb, P., & Croft, H. (2016). Visualizing rugby game styles using self-organizing maps. *IEEE Computer Graphics and Applications, Graphically Speaking.* November/December 2016. Editor: André Stork.

Croft, H., Lamb, P., & Wilcox, B. (2016). Developing a strategy based on game style clustering: A netball case study. World Congress of Performance Analysis in Sport XI, Alicante Spain, November 2016.